CALIFORNIA ENVIRONMENTAL CONTAMINANT BIOMONITORING PROGRAM

(BIOMONITORING CALIFORNIA)

SCIENTIFIC GUIDANCE PANEL MEETING

CONVENED VIA WEBINAR BY:

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

STATE OF CALIFORNIA

FRIDAY, NOVEMBER 18, 2022

1:00 P.M.

JAMES F. PETERS, CSR
CERTIFIED SHORTHAND REPORTER
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APPEARANCES

PANEL MEMBERS:

Megan R. Schwarzman, MD, MPH, Chair

Carl Cranor, PhD, MSL

Lara Cushing, PhD, MPH

Oliver Fiehn, PhD

Eunha Hoh, PhD, MSES

Ulrike Luderer, MD, PhD

Thomas McKone, PhD

Penelope (Jenny) Quintana, PhD, MPH

José R. Suárez, MD, PhD, MPH

OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT:

Vince Cogliano, PhD, Deputy Director, Scientific Programs

Cheryl Holzmeyer, PhD, Health Program Specialist, Safer Alternatives Assessment and Biomonitoring Section, Reproductive and Cancer Hazard Assessment Branch

Stephanie Jarmul, MPH, Senior Environmental Scientist, Safer Alternatives and Biomonitoring Section, Reproductive and Cancer Hazard Assessment Branch

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH:

Kathleen Attfield, ScD, Chief, Biomonitoring Investigations and Outreach Unit, Exposure Assessment Section, Environmental Health Investigations Branch

Dina Dobraca, MPH, Research Scientist III, California Department of Public Health

APPEARANCES CONTINUED

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH:

Jianwen She, PhD, Chief, Biochemistry Section, Environmental Health Laboratory Branch

Jeff Wagner, PhD, Chief, Environmental Health Laboratory Branch

Nerissa Wu, PhD, MPH, Chief, Exposure Assessment Section, Environmental Health Investigations Branch

GUEST SPEAKERS:

Nayamin Martinez, MPH, Central California Environmental Justice Network

Gina Solomon, MD, MPH, Public Health Institute, University of California, San Francisco

INDEX

PROCEEDINGS

DR. COGLIANO: Good afternoon, everybody. I'd like to welcome you all -- to the Panel members, to the audience, and to the California Environmental Contaminant Biomonitoring Program meeting, also known as Biomonitoring California.

Thank you all for participating and for sharing your expertise and experiences. The Panel last met on July 22nd, 2022. The meeting included updates on Biomonitoring Program activities, including community biomonitoring studies. The Panel, staff presenters, and audience members delved into planning for future Program activities, as well as provided feedback on current activities. Key discussion topics included the utility and limitations of weighted study data, opportunities and challenges of non-targeted analyses, expanding the dissemination and impact of biomonitoring study findings, collaboration opportunities and other ideas for future community biomonitoring studies, and development of a Request for Information to identify potential collaborations with academic and community partners. A summary of input from the July meeting and the complete transcript are posted on the July meeting page on biomonitoring.ca.gov.

I'll now invite Panel members to introduce

themselves. I'll call on you in alphabetical order by last name. Please unmute yourself and state your name and affiliation.

First, Carl Cranor.

PANEL MEMBER CRANOR: Carl Cranor, Distinguished Professor or Philosophy, faculty member of Environmental Toxicology at the University of California, Riverside.

DR. COGLIANO: Thank you.

Laura Cushing.

PANEL MEMBER CUSHING: Hi. I'm Laura Cushing. I'm an Assistant Professor in the Fielding School of Public Health, Environmental Health Sciences at the University of California, Los Angeles.

DR. COGLIANO: Oliver Fiehn.

PANEL MEMBER FIEHN: Hi. My name is Oliver Fiehn, full Professor at University of California at Davis at the Genome Center.

DR. COGLIANO: Eunha Hoh.

PANEL MEMBER HOH: Hi. I'm Eunha Hoh. I'm a Professor and Division Head of Environmental Health at the School of Public Health at San Diego State University.

DR. COGLIANO: Ulrike Luderer.

PANEL MEMBER LUDERER: Hi. I'm Ulrike Luderer. I'm Professor in the Department of Environmental and Occupational Health and Director of the Center for

Occupational and Environmental Health at the University of California, Irvine.

DR. COGLIANO: Tom McKone.

PANEL MEMBER McKONE: Hello. Good afternoon. I'm Tom McKone, Professor Emeritus of Environmental Health Scientist -- Sciences at the University of California, Berkeley, School of Public Health.

DR. COGLIANO: Jenny Quintana.

PANEL MEMBER QUINTANA: Hi. My name is Penelope, or nickname Jenny, Quintana. I'm a Professor of Environmental Health at the San Diego State University School of Public Health.

DR. COGLIANO: José Suárez.

PANEL MEMBER SUÁREZ: Hi. José Suárez, Associate Professor in the Herbert Wertheim School of Public Health at the University California, San Diego.

DR. COGLIANO: And now our chair, Meg Schwarzman.

CHAIRPERSON SCHWARZMAN: Hi, there. Meg Schwarzman. I'm on faculty at UC Berkeley School of Public Health, Environmental Health Sciences Division and I'm also a family physician. Thank you all for being here. It's nice to have a quorum. It's nice to have everybody here. I mean, we always have a quorum. It's nice to have everyone here.

So the thing that we need to start with is a

reminder for Panel members to comply with Bagley-Keene requirements. And that is that all discussions and deliberations of the Panel need to be conducted during the meeting and not at breaks or with individual members of the Panel, either on- or off-line, including via phone, email, chats, or text messages.

And so I want to announce the Panel goals for the meeting. As usual, we'll start with an update on Program activities, including the AB 617 community biomonitoring studies and we'll follow that with a discussion to gather input from Panel members and the public that will inform the Program's priorities for upcoming work. And we'll also be hearing from our guest speakers on the FRESSCA-Mujeres project. That's -- FRESSCA stands for Filtration for Respiratory Exposure to wildfire Smoke from Swamp Cooler Air.

And the Program -- the Biomonitoring Program is planning to add an exposure biomonitoring component onto that project.

There, as usual, will be time for questions from the Panel and the audience after each presentation. During the question periods after each talk, so you know how it will happen in this remote format -- speakers please remain unmuted with your webcam showing, so that you can respond to questions from the Panel and from the

audience. And if SGP Panel members want to speak or ask a question, please raise your hand. I'll call on you at the appropriate time. You can physically raise your hand. It would also work if you put the raise hand function on Zoom, but I'll be watching. And you can then, of course, unmute yourself and ask your question or provide your comment.

If attendees of the webinar have questions or comments during those question periods after each talk, you can submit them via the Q&A feature of Zoom webinar or by email to biomonitoring@oehha.ca.gov. That's biomonitoring@oehha.ca.gov. We won't be using the chat function of the webinar during the meeting. So keep your comments brief and focused on the items under discussion. We will read aloud any relevant comments, paraphrasing as necessary. If webinar attendees wish to speak during the public comment periods and discussion sessions, please use the raise hand feature in Zoom and I'll call on you.

So to start with our update on the Program, I want to introduce Nerissa Wu. Nerissa is Chief of the Exposure Assessment Section in the Environmental Health Investigations Branch, or EHIB, of the California Department of Public Health, CDPH, and the overall Lead for Biomonitoring California. She will give an update on current Program activities and provide information related

to future planning.

(Thereupon a slide presentation).

DR. WU: Hi, everyone. Give me a minute to share my screen.

All right. Does everyone see that?

CHAIRPERSON SCHWARZMAN: Looks good.

DR. WU: That's sort of assent.

All right. Well, good afternoon, everyone and welcome. Thanks for joining us.

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DR. WU: I'm going to spend my time giving some administrative updates about the Program and then I'll talk through some different Program activities focusing first on our surveillance work and then moving along to our community biomonitoring projects. I'll talk about some of the activities taking place in our labs before finishing up with some work that we are doing on our new communications team.

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DR. WU: So in the past, I have talked a little bit about how our new budget has enabled us to add a number of positions. So we've gone through kind of an enormous administrative task of getting those positions created and having people interviewed and everything. So we're starting to see fruition from that.

I'm very pleased to announce that we have four new staff people here at EHIB. We have Kelly Chen and Toki Fillman joining us in Kathleen's Epi Unit. And we have Kiera Melton and Andrew Tan who are part of the Outreach and Communications Unit. So welcome to them all. We're looking forward to having them learn all about biomonitoring and contribute to the Program.

Unfortunately, I do have to announce that Adam D'Amico, who is a Research Scientist, has left our Program. You might not be familiar with his name. He didn't have the opportunity to present at this forum during his time with Biomonitoring, but he was actually a key architect of the CARE Study and instrumental in our work to put together the CARE report. So I just want to acknowledge him and thank him for all of his hard work.

We do have an APHL Fellow also joining us in EHLB, Jon Gallardo, who is now working with Jianwen and his staff to learn about and help optimize all of our lab methods. So welcome to all of you.

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DR. WU: There are still a number of open positions in the different components of Biomonitoring and actually in many statewide programs overall. So I just want to highlight that there are many positions posted for research scientists, health educators, toxicologists. So

if anyone on the line is interested in joining a very dynamic and very passionate group of people working on all these important issues, please visit these websites to learn about job postings or contact us. I'm always happy to talk to people about what it's like to work for the state.

Oh, whoops. Oh, no. I think I've gone to the website. Hold on. Let me go back to my slides.

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DR. WU: Alright. Well, now let me talk about our surveillance work starting with the California Regional Exposure Study, or CARE. And we have talked about this in this forum before that for all CARE participants, we do metals and PFAS analyses. And those analyses have been completed and results returned to participants, but there are some analytes for which only a subset of participants are included.

For example, for phenols, because of time constraints, we weren't able to include all participants, so only 60 CARE-LA participants, and those were all women, and only 150 CARE-2 participants were included in the phenols subset. We also don't measure inorganic arsenic in all participants. Typically, everyone gets urinary arsenic and we measure total arsenic in that round. But then for people who meet the 19.5 micrograms per liter

threshold for total arsenic, we then speciate the arsenic. And people who meet or exceed our level of concern for inorganic arsenic are then followed up on.

But this means that we have limited data on inorganic arsenic levels in the population. We have 20 LA participants and 10 CARE-2 participants for whom we have inorganic arsenic data. But this coming year, EHLB is going to help us run phenols and speciated arsenic on additional participants, so that will enable to us share more data with those participants which is a bonus, but it will also enable us to calculate population estimates and support more robust statistical analyses to look at things like demographic differences and exposure factors for those panels.

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DR. WU: Going forward, we're going to be using the Genetic Disease Screening Program banked samples for surveillance. And a quick reminder that GDSP provides prenatal and newborn screening to Californians. And approximately 70 percent of pregnancies in California go through this prenatal program. And that involves the collection of a first trimester and a second trimester serum sample to assess the risk of genetic diseases. And the second trimester samples from seven counties, highlighted here in green are banked as part of the

Biobank.

So the use of Biobank samples has a couple distinct advantages for us. Given the difficulty with participant recruitment that biomonitoring and pretty much every other surveillance group has faced, this is a unique opportunity for us to get a population-based sample. And these samples are at much lower cost than the field collection of samples.

But this also represents exposure during pregnancy, which, of course, is a uniquely sensitive time point of exposure, so we'll be able to get information on how this whole new generation of Californians are exposed to and impacted by PFASs.

And, in fact, the recent report from the National Academies of Sciences on PFAS exposure testing and clinical follow-up noted that there is not sufficient information on PFAS exposure among pregnant women and they recommend oversampling in NHANES in the future. So I think the data that we generate from our work from the Biobank will be very informative and useful.

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DR. WU: So in the past, we've conducted MAMAS, the Measuring Analytes in Maternal Archived Samples. This was first a pilot to evaluate the use of Biobank samples, but then as a precursor to CARE in that we approached the

challenge of assessing exposures across the state by grouping counties into regions.

MAMAS samples were racially balanced, evenly divided between White, Black, and Hispanic, and Asian mothers, so not reflective of the population. We obtained samples from 2012, 2015, and 2016 pregnancies from the regions you see listed here. And we focused on POPs and PFAS analyses for those samples. And we're actually almost to the point of posting MAMAS data from all those different phases on our website.

But we've used our lessons from MAMAS to design this new phase of surveillance Studying Trends in Exposures in Prenatal Samples, or the STEPS study. And for STEPS, we are going to use random sampling or stratified random sampling to generate population data. And as I mentioned earlier, sampling from Biobank enables us to generate a really solid population estimate among pregnant Californians, which we can then use to understand time trends. So our plan is to implement both retrospective and prospective sampling, so we can maximize our coverage of California both geographically and temporally.

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DR. WU: A reminder of some of the challenges we face with Biobank samples; it does only include those

seven counties, so that's not full coverage of the state. The samples are serum only and it's very low volume, so that limits the types of panels that can be run. And our lab can analyze about 500 samples per year for PFAS. And I am -- I keep mentioning PFAS, which really is the priority for this project at the time, but we do hope to be able to include other analyses, as we have available sample volume and appropriate methods in the future.

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DR. WU: So for the retrospective part of this sample of the study, our plan is to focus on two Biobank counties. We're going to link GDSP data with the vital stats birth record data to create a sampling frame of eligible samples and our eligibility criteria. The mother has to participate in the statewide Program, of course, and then they have to be eligible for Biobanking, meaning that no Kaiser patients are included, and also pregnancies with a diagnosed genetic disease are not included. And we'll be including live singleton births and nulliparous individuals. And that's so that we can eliminate the variability that prior pregnancies or breast feeding would introduce.

We'll also limit the data in some ways by maternal age, gestational age, and gestational weight just to frame our cohort and also to eliminate erroneous data

from data entry errors. So we've done power calculations and we've determined that if the trends seen in NHANES among 18 to 49 year old females holds true for Californians, then our data, with our 500 samples per year spread between three time points should have sufficient power to detect temporal trends in most of the legacy PFASs.

Because we want to be able to characterize current PFAS levels as well, we want to include the most recent samples available from Biobank, so that would be 2021 pregnancies. And then we'll work our way backwards in time to create time trends. And so our current thought is that we would include 2015, 2018, and 2021 pregnancies, but this is still under some debate. And I should say that for any one of our study design decisions, we've really debated these options. And based on literature and input from other researchers are just trying to make the best guess as to what our study design would give us the most valuable information.

But there are obviously trade-offs for any decision we make. We could go back further in time, maybe to 2010 or 2012, but we would either then miss our more current data or we would have to stretch our time trend out over more periods of time -- over a longer period of time. So we really need to think about what time period

is most important for us to understand.

Another example is that in selecting where we pull samples from, we've decided to go with two Biobank counties instead of focusing on one. And that will give us better coverage of California and an understanding of if there are differences in temporal trends in different areas, but we might be giving up the ability to look at demographics in any particular county, because we just won't have the numbers of samples to look at that. So as you know, anytime you're designing a study, there are trade-offs, and that's something we're wrestling with.

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DR. WU: In a second phase of steps, we would like to sample prospectively from a non-Biobank county. And this is pending negotiation with GDSP, because there's not the same mechanism like Biobank to save and obtain these samples. Birth records aren't available for births until one to two years post-birth, so we don't have the same opportunity to set up that sampling frame. And there's some information that we don't have until that birth record is available.

So our plan is to randomly sample from the selected county and we'll oversample, recognizing that some of the samples are not going to meet our inclusion criteria, but retrospectively we will get the birth

records for those samples and then we can go back and identify which samples are eligible.

So, for example, parity information on a pregnancy is not available from GDSP. It's not available until we get the birth record. So we know that when we pull samples, there will be multiparous pregnancies in there and we can identify them retrospectively and either decide not to analyze them or we could analyze them and then adjust or stratify for parity when we do our statistical analysis. And certainly there are things we could learn from that data as well.

And just a reminder for the non-Biobank samples, there is more volume available, because they're not split with the Biobank, and so there is a greater potential for additional analyses.

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DR. WU: So what this gives us, if all goes as planned, and I'm sorry this slide is just so super busy, is that we'll have samples from three time points from two different Biobank counties. And they're represented here as Counties A and B. The lab will analyze those over the next two years. And then in 2024, we'll sample prospectively from a non-Biobank county, that's County C. And when we get to 2025, we'll be able to grab another time point from Counties A and B and then we'll move

forward.

So this sampling plan will enable us to do a few different things. One is we'll be able to evaluate retrospective time trends in Counties A and B and compare those two counties, see how similar they are. We'll be able to compare 2024 PFAS levels in all three counties. And then going forward, we'll have time trend information on all three counties.

I'm just going to stop talking for a minute and let you sit with this slide for a second, because there is a lot of stuff going on here.

And I can post that again if anyone wants to look at it later.

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DR. WU: We have been meeting with a number of stakeholders, researchers, advocates to collect input on study design. And this has been super interesting and really informative just hearing what other people are working on, and what their priorities are, and how they might use our data. And this would be a great forum. We'd love to have your input on the sampling plan as well. Just a cautionary a note that we can't do everything and we're really trying to maintain our focus on our primary goal, maintain enough power to look at those time trends. So there are some limits on what we can do with this --

with this study.

But our questions are which criteria should we be considering for selecting counties for retrospective samplings. And I should say that for one of these counties, we're really strongly leaning towards Orange County, given its known drinking water and PFAS issues. And that there have been some interventions that have taken place over the last few years with wells being taken offline.

So for the second county, there are just a lot of things to consider. Do we want a county that's somewhat similar to Orange County demographically or geographically, or do we want a county that's really different, like one of the Central Valley counties? Could we assume that PFAS levels are similar in the Central Valley counties and maybe think of Central Valley as a region or do we really want to focus on one county from Central Valley?

While we've been focusing on PFAS, there are also these opportunities to do other analyses. So if there's a potential difference in exposure between Orange County and the second county that we really want to learn about that's something else to consider.

We have a similar question for our prospective sampling. We are limited in which -- in that we have to

work out an agreement with a prenatal screening lab to grab samples from them. But within that, what are the criteria we should be considering in our selection for -- of a county for prospective sampling. So again, that would be counties that are not included in Biobank.

And finally, our criteria for sample selection have been really focused on parity again to control variability that might be introduced by prior pregnancies or breast feeding. And we're focused on live singleton births, but are there other criteria that you might want to suggest for us to consider for exclusion.

And I'm going to move on from this slide, but we can put it back up during the discussion for a prompt for our questions.

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DR. WU: So I'm going to turn to our community-focused studies and I'm going to provide some updates on the current activities for our ongoing studies on the Stockton Air Pollution Exposure Project, or SAPEP and BiomSPHERE, the Biomonitoring Component of the San Joaquin Valley Pollution and Health Environmental Research Study. I'm also going to briefly describe plans for the next community biomonitoring project, which is an add-on to the Filtration for Respiratory Exposure to wildlife Smoke from Swamp Cooler Air, the FRESSCA-Mujeres Project.

And then we're going to be hearing details about the overall FRESSCA-Mujeres project from our guest speaker. So I will just touch briefly on that.

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DR. WU: For SAPEP, we anticipate sending our first packet of results to participants in January. And that's going to include biomarkers of exposure, so PAHs, VOCs, and nicotine. And then an additional packet of results for biomarkers of oxidative stress and inflammation will follow later in 2023. So they'll be getting two different sets of information. We're also following up on SAPEP with an air monitoring study, which is going to compare indoor and outdoor PM2.5 ratios before and after replacement of the school's MERV 6 filters with MERV 13 filters. And that will be in classrooms with and without portable air purifiers.

And I think last time we met, we talked a lot about whether or not those purifiers were actually on or whether teachers were turning them off because of the noise. Well, the project will include the installation of data loggers on those air purifiers so that we can actually track when they're being used. And then we'll continue to work with our community partners on the ways we can best distribute the findings of the study.

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DR. WU: For BiomSPHERE, participant recruitment and fieldwork are scheduled to begin in the next few weeks. And the biomonitoring component of this is going to include collecting urine samples and administering pre- and post-sampling questionnaires, which are available both in English and Spanish. There's also an environmental sampling component collecting air samples at participant homes and conducting personal air sampling for PM2.5, and that fieldwork is scheduled to continue through July.

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DR. WU: So that was a super brief overview of those studies. We have talked in more detail about them at past meetings. So if you're interested in more information, we do have the project pages on our website. We have a new BiomSPHERE page up. We also have gone into detail at previous SGP meetings and we have links to those meetings on our website as well. And, of course, Susan and Stephanie are here, if anyone has a question about those studies.

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DR. WU: For our next community biomonitoring project, we're planning to add biomonitoring to the FRESSCA-Mujeres Study. And the fieldwork for this is scheduled to begin in the spring.

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DR. WU: So very briefly, the primary objectives of the biomonitoring component of this project are to measure urinary biomarkers for certain air pollutants, VOCs and PAHs, during normal conditions and then again during a wildfire event. The participants will be the 50 female agricultural workers that were enrolled in the FRESSCA-Mujeres Study. And this work is going to help us understand air pollution exposures in Kern and Fresno counties and it will also help the evaluation of the effectiveness of these air filtration systems.

So rather than go into more detail now, I'm just going to leave it at that. We have Gina Solomon and Nayamin Martinez coming after me to talk about the study in more detail. So actually in our discussion, I'll ask that you hold questions about the study until they have a chance to talk about it in more detail.

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DR. WU: On the lab side, for the Environmental Health Lab, as I said earlier, the lab will be conducting additional analyses for the CARE study. So thanks to them for that effort. They are also going to continue to work on the method for urinary VOC metabolites measuring 30 metabolites from 21 parent VOC compounds. This method is in its final stages of development and we're hoping to validate in early 2023. The lab is also working on the

speciated urinary mercury method to measure inorganic mercury and monomethyl mercury. They're currently looking for a certified isotope-labeled standard to validate the method. And they're also learning more about how the samples need to be preserved after collection. That's on a similar time frame. We hope that the method will be ready for use in early 2023.

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DR. WU: Over in the Environmental Chemistry Lab, they've completed validation of the expanded PFAS measure -- method, so they can now measure 44 PFASs, 37 of which have a method detection limit between 0.01, 0.01--0.05. And then there are an additional seven analytes with a slightly higher MDL. And the new list includes GenX and ADONA, two of the replacement PFASs that we have wanted to track. So it's really awesome. ECL is currently using this method to analyze paired serum and plasma samples that were collected as part of the Intra-Program Pilot study. So in early 2023, we should have data from this new method and that will include data from these different sample media that we can compare.

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DR. WU: And finally, our Communications Team. I've mentioned in the past that the new funding enabled us to create an entire unit focused on outreach and

communication. So this group is currently focused on finalizing the layout of the CARE report. And this graphic dashboard-style summary, which you can see here, this kind of handout will provide a more accessible overview of our findings. And we hope this helps us expand the impact of our work.

The team is also planning to create more public facing-document, things like fact sheets and a newsletter to make our work and recommendations to the public more readily understandable and accessible.

And finally, we've talked about our plan to get our data posted in a forum that will enable researchers to take a look at it and see if they would like to use our data for their own work. And the process to get this designed and posted on the website is also in process.

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DR. WU: So in closing, I just want to mention the lawsuit that the California Attorney General has announced. In this lawsuit, the State alleges that multiple chemical companies have caused or contributed to the widespread PFAS contamination to our environment, our drinking water, and to our bloodstream of Californians. The complaint cites multiple Biomonitoring California studies starting with MIEEP, one of our first studies, through CARE, all of which have found PFASs in over 99

percent of our study participants.

We're not actually party to the lawsuit, so if there are questions about it, I would refer you to the AG's office. But the use of our data in this very tangible way to support the lawsuit is a great demonstration of the value of our work. And it's just -- it's gratifying to see it. This is what we work so hard to do and it's a great use of the data.

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DR. WU: So, in sum, there's a lot going on. The Program is starting to reap the benefits of our new larger budget and the expanded staff. So thanks to all of you who have advocated for us and supported us along the way, and I look forward to our discussion.

CHAIRPERSON SCHWARZMAN: Thank you so much for that rich summary of everything that's going on, Nerissa. We have 10 minutes now just to start with questions or clarifying questions from Panelists, and we'll follow that with public comment, and then a longer like 20-minute discussion session.

So this moment is for clarifying questions for Nerissa. And while the Panelists are gathering their questions, I just wanted to start with one, which is it's so exciting to hear about the GDSP sampling projects and their ability to gather time-trend data. It's just really

exciting.

And I had one question. I appreciated your presentation of the power calculations, because we always have that question, right? You do, too. And one thing that jumped out at me was the -- that they were based on the NHANES levels. And we could talk offline about this in more detail, because we're working on a manuscript right now that presents some data that we got from the Restricted Data Center at CDC, that let us compare California levels measured in NHANES to the general NHANES levels. And for PFAS, we found significantly lower levels in the California population. So you're probably already aware of this and have compared your own results to NHANES. But if there's anything else that would be helpful, we haven't published the manuscript yet, so we could work with you, if any of that information would be helpful.

DR. WU: Yeah, we have done our own comparison of the CARE data, of course. And then we don't have the restricted access NHANES data, but we've taken a look at all of the data we've collected through our different studies and in the literature. And we do see that for some of the PFASs, California is lower. But we -- this is maybe a more detailed conversation than we can get into here, but I wonder if Kathleen or Dina wants to address

this, since it was their work.

CHAIRPERSON SCHWARZMAN: Sure. And I just wanted to raise that we have this additional source of data if that's helpful to you in thinking about those power calculations. I know that you all are doing a very thorough job of this, so I didn't mean to like question the work, just say that we have additional data from the Restricted Data Center that we could -- that we can share, because we're about to publish it, right?

DR. WU: And you are able to share, I mean --

CHAIRPERSON SCHWARZMAN: Yeah, the data that's -- that will be in our -- that we'll be in it's -- that will be in our publication, sure.

DR. WU: Okay. Great.

CHAIRPERSON SCHWARZMAN: We don't have anything that we can't share.

Kathleen, did you want to add to that?

DR. ATTFIELD: Yeah. I'm sorry. My camera doesn't seem to be working at the moment. Thank you for that actually. We are additionally looking for other sources of trend information to, you know, double-check our calculations.

Just to clarify, that we're using NHANES mostly to do the power calculation for the trend, so not just for levels, but make -- having to make the assumption that if

we see the same kind of trend continuing, would we be able to capture that within how we divide our number of samples over the number of years.

Yeah. And to point out that yeah, we do see racial trends in our CARE data, especially with lower levels of PFAS in Hispanic populations, so that may -- because NHANES does, you know, target Los Angeles specifically a lot for enriching the Hispanic component of NHANES, that some of the sources of data that rely on NHANES within California, you know, may have a little bit of the bias lower. But, yeah, thank you for the offer. We would be really interested in making sure we look at different trend data sets.

CHAIRPERSON SCHWARZMAN: Jenny.

PANEL MEMBER QUINTANA: Hi, Nerissa. Thank you for that talk. And I was thinking about that slide that you lingered on, because you said there was a lot of numbers there. I think it was the sample sizes.

That one, I think.

And I don't recall if we already discussed this, and I apologize if we did, but if you're looking for time trends and you have relatively low numbers here, compared to say an NHANES sample of thousands and thousands, have you thought about pooling the samples, because then you could -- you could really look at the time trend with a

more robust -- samples where you pooled, samples that you said -- pull 10 samples at a time or something. Have you thought about pooling samples to kind of increase your sample size, but still being able to look at time trends or not? I think that was done in the early work on the flame retardants quite a bit.

Thank you.

DR. WU: Yeah, and NHANES does only provide pooled sample results for flame retardants at this point.

PANEL MEMBER QUINTANA: No. No. Pooling the samples before you analyze them.

DR. WU: Yes. Yes.

PANEL MEMBER QUINTANA: Yeah. Yeah. Sorry, that's what I mean.

DR. WU: That's right.

Yeah, I mean, we have talked about pooling samples, not only for MAMAS, or STEPS, or for other samples as well, because of the advantages you've pointed out, but I think there are some issues with like what does that represent when you pool? And you have to think about what parameters you'll use to define those pools and whether you can make assumptions about the similarity between those samples. Like, do you pool based on race or demographics? I mean, you would have to make some assumption that those -- that you're not missing some

variability within that -- within that strata. So, I mean, it's possible we could do this at some point.

I think with our PFAS focus, we have the volume and we should -- we should learn what we can with the samples without pooling, but I would envision that going forward, like if we've established this methodology and feel comfortable with doing pooling over different strata, that is something that we would consider doing. This kind of sample actually does lend itself well to that, because we don't have a results return component of it.

PANEL MEMBER QUINTANA: Right, because, I mean, you are making assumptions when you pool, but you're also making assumptions when you have low sample numbers that they are comparable as well. Know what I mean? So kind of a trade-off.

Thank you.

CHAIRPERSON SCHWARZMAN: Ulrike.

PANEL MEMBER LUDERER: Yeah. Hi. Thank you for that great overview of all the wonderful work that the Program is doing. My question was, it's a really striking thing looking at the Genetic Diseases Screening Program counties that are -- that are Biobanked is that it's not very geographically representative. And I was wondering is there -- is there -- maybe this has been talked about before, but was there a particular reason for that or

anything? It doesn't seem random. Let's put it that way.

DR. WU: I think it's based on where the Birth Defects Monitoring Program had set up their ongoing surveillance, but that is -- I mean, the Biobank is outside of our purview. And, yeah, it is kind of an odd selection of counties, I guess, but that's not something that we can -- we can impact. We do hope that with negotiations with the GDSP, we will be able to, you know, expand beyond this, because, I mean, there's just a lot to learn. And I think that question of whether we can assume that one county represents or two counties represent the State, we really want to take a look at that and understand, you know, if a place like Orange County, which has had some interventions and has been very active in the whole PFAS monitoring world, whether that has a different profile and a different time trend than another county. That's something we really hope to understand with this work.

PANEL MEMBER LUDERER: Thank you.

CHAIRPERSON SCHWARZMAN: José.

PANEL MEMBER SUÁREZ: Yeah. Well, while we're on this slide -- I have a couple questions, but while we're on this slide. So, you mentioned there that non-Biobanked samples may be available in the larger quantity than the 0.5.

DR. WU: Um-hmm.

PANEL MEMBER SUÁREZ: And I suppose it's really -- it depend -- it would depend on how agile the Program is to actually secure those samples, because it sounds like they only hold on to them for like a month maybe or --

DR. WU: That's right.

PANEL MEMBER SUÁREZ: -- how long -- yeah, one month. That's right.

DR. WU: Um-hmm. Yeah.

PANEL MEMBER SUÁREZ: So in that sense -- okay -- okay. I think that opens up a lot of stuff. And I guess the question is would they be amicable for you to store some of those samples so you can keep measuring other stuff into the future that you want?

DR. WU: Yeah. So let's see, there are a few things I want to address in there. The samples are roughly twice the volume, because for Biobank, they split them in two aliquots. They hold on to one. So we might be able to get almost one ml. for each of those. And yeah, that enables us to do other analyses. Although, in the past, we have had trouble with POPs, because for POPs, you need to do a lipid analysis and you just need more sample, so that's been a challenge to us.

Non-Biobank labs typically just hold on to them

to confirm their genetic disease results. And then at the end of the month, I believe they clear out their storage. But what our hope is is that, and we have done this before for MAMAS, we've -- we'll be able to negotiate with a lab, so that we grab a certain -- maybe it's the first samples coming through every month or maybe it's we identify them through Genetic Disease and pull, you know, some random group of samples from a particular county, but that where we can pull from will depend on the lab being amenable to setting up, you know, this kind of different mechanism.

But the way our IRB protocol and our Biobank protocols are written, we can use the samples for environmental chemicals. It's not restricted to PFAS or a particular analysis. And so as long as we're in adherence with our protocols for, you know, management of these samples, we can hold on to them and do additional work.

PANEL MEMBER SUÁREZ: Okay. Okay. Oh, fan -- I mean -- and there are no restrictions, I guess, from say GDSP actually for how those samples may be used?

DR. WU: No. No. Our protocol is fairly flexible in terms of, you know, just looking for environmental contaminants.

PANEL MEMBER SUÁREZ: Yeah. No. No. I meant more from their side. So GDSP actually have restrictions on how you could -- or how much of those unused samples

you may be able to actually store for the future. Sometimes, they don't like that.

DR. WU: Yeah, but I don't think so, no.

PANEL MEMBER SUÁREZ: Okay. Fantastic. And then maybe I might have missed it. So for the prospective sampling now for the non-Biobank, what's the -- how are you planning on -- so what's the protocol there? You're contacting different labs that may be doing some of this, is that what I'm understanding?

DR. WU: Yeah, the prenatal screening is run at they're called NAPS labs, Newborn and Prenatal Screening labs. There are three of them in the state. And so based on what county the pregnancy is taking place in, they go to one of these three labs and some of those labs have a -- you know, already have a relationship with -- I mean, they all have a relationship with GDSP. Some of them have some experience in saving samples for researchers, for example. In MAMAS, we've been able to do this with some of the NAPS labs.

So in that case, we would -- as we've done before, we might be able to say, well, we're focusing on LA County. So the first, you know, 30 samples per month that come through from LA County, we want to tag those to be saved for us. We haven't figured out the details of that -- that sampling protocol yet. We're really focused

on the retrospective right now, since it's coming up sooner, but I think there's -- there are a variety of ways in which we could choose to sample.

PANEL MEMBER SUÁREZ: And you do have in your IRB and actually are you provided with identifiers of participants?

DR. WU: So we have -- not their names. We do have their addresses, and -- you know, but a selection of information about the pregnancies, about the parent.

PANEL MEMBER SUÁREZ: But you have access to the birth records eventually after one or two years, right?

DR. WU: Yes.

PANEL MEMBER SUÁREZ: And you would have information of names and addresses and know that stuff there eventually --

DR. WU: Yes.

PANEL MEMBER SUÁREZ: -- you would expect, right?

DR. WU: Yes.

PANEL MEMBER SUÁREZ: And you wrote your IRBs to account for that, that you might be getting this identifier information. Because I think -- I think it's very valuable to have that information, if you want to do follow-up on the same participants later on and go for other research purposes.

DR. WU: Oh, I don't think we are allowed to do

follow-up with the participants. And maybe Dina is on and could speak to this a little better. We don't have anything -- and we -- the way prenatal screening permissions work for saving other samples is people opt in to the saving of their sample for research, but it's a sample only. We don't -- the participants themselves are not involved with our study and there's no contact between us and those participants. So there's not an opportunity for us to go back, for example, and ask questions of those participants or to do follow-up sampling.

PANEL MEMBER SUÁREZ: But if you have the infor -- if you have their contact information, I mean, technically somebody else could potentially do a follow-up on those participants or maybe as part of a different project, if that's -- there would be a name of a new project, right?

DR. WU: I don't think we have the permission to contact them though. So I think that would -- yeah, I mean I think in the way they are consented into the research bank of Biobank or into actually even just doing prenatal screening, I do not think would allow us to do a recontact, even to recruit them into a subsequent study.

PANEL MEMBER SUÁREZ: Okay.

DR. WU: I see Dina has her hand up though. She has more recently looked at this though.

Dina. Sorry, Meg. I'll let you call on her.

CHAIRPERSON SCHWARZMAN: No, please. Go ahead.

MS. DOBRACA: Hi. This is Dina Dobraca from California Department of Public Health.

So in our IRB protocol, we have to justify every variable that we receive from Biobank and explain how we're going to use it. So we are not receiving names, but we are receiving other identifiable information, such as an individual's date of birth, an individual's pregnancy information, an individual's address. And we have explained that we will be using that information to understand more about an individual's environmental exposures or because it's an important confounder such as age or parity to understanding this relationship.

We also have to put in our approvals if we would ever do any linkages with this data in the future. And we have to provide that justification to both the State and to separately the Vital Statistics Advisory Committee to all of our approval agencies, we have stated that we are not linking any data for it to become identifiable to those individuals. So that is the limitations on our approvals.

PANEL MEMBER SUÁREZ: Okay. A just quick thought. I know there's going to be maybe -- or should we pause questions here. I don't know if you want to move

things forward with other stuff, but I have more questions in that regard.

CHAIRPERSON SCHWARZMAN: José, I think you can go ahead. Once we've finished these questions, we'll open it up to public comment and then have additional discussion time, but we're not tight for time.

PANEL MEMBER SUÁREZ: Okay. Okay. I mean, I think -- I mean, I'm thinking of the other side of things, right? I tend to do a lot of research on prospective cohorts, and this seems like very low-hanging fruit where even a birth cohort could be started at the snap of a finger pretty much since you are already collecting this information, which could open up the opportunity for a lot of other investigators to start doing something like that, which might be something interesting, and happy to have more discussions about it.

But if there's a possibility at least of having some sort of a way to then eventually link it back to the information within the birth certificates, then that could open up a lot of different collaborations and opportunities, even though -- even though you may not -- you know, it's not an objective of yours to do the follow-up of those participants, but it leaves an opportunity for other investigators to maybe start going in that direction or who knows maybe into the future it

may be of interest to the Program to do a follow-up of the exposures of the same participants.

So if there is some way to start thinking about maybe an amendment even to some sort of IRB protocol that's of interest to you, I think it could be a way to not go into this missed opportunity of collecting some of this valuable information. Now, is there -- with the information that you are getting from the birth records, is there some sort of identifier? Even though you don't have the identifier per se, but is there some sort of code that you could into the future then link it to the full contact information that is available in the birth records?

DR. WU: So there are two kinds of things. I guess these are not totally overlapping types of studies. I think there are ways that we can use -- and we have been clear in our IRB amendment that this would be a separate study, that somebody could take this data and link it to additional databases and do that kind of outcome work. So that is already a possibility. I think again for the contact -- the recontacting of participants, that's something that I think really doesn't fall within our purview, because the initial consent is happening at GDSP. They're a different program. And I don't know how -- I don't think we can really control that. I mean, it -- I

mean, it's certainly something we can discuss with them and maybe there's some study within a study we could do, but I think the way it's set up now, that that would be harder to pursue.

But I do agree with you that there's a lot of potential for this work to link with other administrative databases and look at -- at various outcomes, and also use that locational data to look at things like geographic impacts. So it work -- that's our hope that this is really going to be a foundation for many, many different kinds of research that can come from the data that we produce.

PANEL MEMBER SUÁREZ: Thank you.

CHAIRPERSON SCHWARZMAN: Let me check in about public comment. Has anyone -- I don't see any hands raised for comments or questions. Is there anything on the website or email that we should know about?

DR. HOLZMEYER: No, nothing yet.

CHAIRPERSON SCHWARZMAN: Okay. In that case, we have time to continue the Panel discussion and input. And I wonder if Nerissa you would put back up -- yeah, the set of questions that you have about the sampling plan input that you wanted and see if Panel members have any comments, or suggestions, or any input they want to provide on this.

I mean, one thought that I had -- you've asked for just opinions about geography of sampling, and certainly knowing what we know about where NHANES tends to draw from, and then the location of the Biobank samples, I guess there's the tension that you mentioned between sampling in the same places to see time trends versus sampling in different places to get a better view of the state -- more representative view of the state overall.

And I may have missed some of the details on this - forgive me if I have - but my inclination is if we can use -- if we can get time tends -- trends data already from the Biobank samples, it would be great to use any prospective sample collection as an opportunity to increase our -- sort of the distribution -- geographic distribution from around the state. I'd be curious to hear how others feel about that.

Ulrike.

PANEL MEMBER LUDERER: Yeah. I'm sort of following up on that. I was going to also say that, you know, the geo -- you know, as we had -- as I meant -- you know, obviously, there's a geographic kind of not ran -- non-randomness to the counties that are Biobanked. And, you know, using the additional -- the prospective county to kind of broaden that geographic distribution, I think would obviously make sense, but then, you know, the

question that you raise then is with just -- if it's just three counties, and I agree then that doesn't give you -- you know, that's not necessarily representative of three counties of the State as whole. So I mean that's a tension that there is.

I think though -- I think if it was going to be three counties, I would favor the same three counties to be able to get, you know, better time trend data for those three counties, but I'm curious to hear what the other Panel members think about that.

PANEL MEMBER SUÁREZ: I have a question.

CHAIRPERSON SCHWARZMAN: Jenny, go ahead.

Whoops. Sorry. I have Jenny and then José.

PANEL MEMBER QUINTANA: Hi. Thank you for that question and your comments, Ulrike. I was thinking back to, Nerissa, you said you're interested in Orange County because of the water contamination. So if -- I seem to remember that you guys presented a quite detailed map of water supply for certain areas. Maybe I'm getting mixed up with a different meeting, but where the water sources were. And if water sources are of interest to investigate, then I feel like they should oversample people on different water sources, on private wells, on small water community waterworks if -- rather than a bunch of people all drinking LA water that's all from the same

source. You know what I mean? So I think I would oversample people on wells and private water systems. And I would also oversample for rural participants who are, as you mentioned, really somewhat left out of -- underrepresented perhaps in NHANES. So I would think about rural participants as well.

CHAIRPERSON SCHWARZMAN: I want to just insert here one quick question that I had overlooked in the Q&A on Zoom, which is just to make sure, are subjects getting compensated for their time?

DR. WU: The partici -- we -- so the participants are not participants of our studies. They're participants of the Genetic Disease Screening Program. So they're undergoing screening and they are consenting to have their samples saved for research and that's the end of their participation as they know. So there is no interaction between us and the participants.

CHAIRPERSON SCHWARZMAN: Thank you for that.

José had a comment and then I have Laura.

PANEL MEMBER SUÁREZ: No, mine was very brief. I was agreeing to Ulrike's suggestion of keeping the same geographic units or same counties if you want to look at trends that we know is all.

CHAIRPERSON SCHWARZMAN: Okay. Great. Thank you.

Laura.

PANEL MEMBER CUSHING: I was just going -- I was thinking about I presume you hypothesize drinking water is the primary source of exposure for PFAS. I don't know if that's true. But, you know, Kern County has a lot of oil and gas drilling. I know they use PFAS in fracking, which isn't super common in California, but I don't know if they use PFAS for other activities, but that might be something to look into in terms of trying to choose a county. And there's also -- you might -- I agree with Jenny, you might want to focus on places where people are drinking -- well, I don't know.

If we know like whether groundwater or surface water tends to have more PFAS contamination, that might be another way to narrow in and, you know, the southern San Joaquin Valley is -- like Tulare County is like 95 percent of people drink groundwater. There's a high proportion drinking untreated groundwater either in a private well or, you know, a small system. And I have some data on that, if that's of interest in terms of where people are drinking from domestic wells. We've tried to estimate that statewide. So maybe potential sources of PFAS and then also sources of drinking water might be things to consider in the retrospective sampling location choice.

DR. WU: We would love to talk to you more for

two of the points you've mentioned. One is that we have been trying to learn more about oil and gas extraction and how PFAS are used. And I believe there is now a reporting requirement for oil and gas extraction sites, but I'm not sure how -- I'm not sure what compliance is like and I'm not sure if PFAS are one of the reportable constituents. And so just learning about that whole reporting side is a whole complicated question, but we would look -- certainly, Kern County with all of its sites is of interest.

And then we would love to talk to you more about water source. We're finding that the drinking water data is very, very complicated. And certainly across the State, where there is data on drinking water, there are detects in many different places, but the MDLs are different, the availability of data is really different. And so it's been difficult to piece together what are the most significant places to look, if we do think that drinking water is the most significant contributor. And whether it is or not really depends on what your drinking water looks like too, right? So it is -- you know, it -- there are lots of -- there are lots of things we're trying to consider in this selection. But that would be really helpful to talk to you more -- a little bit more about the water mapping that you've done.

CHAIRPERSON SCHWARZMAN: Great.

Gina Solomon.

DR. SOLOMON: Yeah. Yes. Thanks. I'm sorry to jump in, but I did want to mention that we're just completing a study called the Tap Water Analysis Project funded by the California Breast Cancer Research Program and we collected tap water samples from primarily small water systems in different parts of the state. And we actually -- it wasn't a ton of samples, a total of 60 different, you know, samples, different areas. And we expected to find PFAS. The analysis -- the targeted testing was done by USGS laboratory for 34 PFAS. And we actually did not have hits in the Central Valley, but we had a lot of hits in southeast LA.

And one of the interesting things about LA is that there's, you know, LADWP that covers a large part of the city, and then there is a lot of very small water systems that mostly use groundwater in the industrial areas in the southern part of LA. And so you can find some -- we found a lot of different PFAS down there. And we'd be happy to share the data if that would be helpful.

All the system boundaries have been mapped and so it's possible with address information to figure out which system people are in and that could be interesting if LA County were selected.

DR. WU: Oh, that would be really interesting. One of the challenges is that the data available, some of it's from tap water, some of it's from wells, some of it's from, you know, like pre-treatment or post-treatment. And just sorting through all of that has been a real challenge. So we would love to talk to you about your data. And I think Kathleen is probably weighing in on this as well.

CHAIRPERSON SCHWARZMAN: Kathleen, do you want to offer something to that before Eunha?

DR. ATTFIELD: Oh, I was actually going to add a slightly adjacent point that because we have information on Los Angeles from the CARE-LA study in 2018, and then eastern and southeastern counties in CARE-2, that we've actually already started working with the Water Board to match up the PFAS data that they have there again variety that Nerissa cites of the types of information that are available. And the conclusions one can take has been complicated to work out, but we are already starting to look at the correlations between our participant information and the water data. Well, we're in the beginning stages I should say, but it's a complementary activity to what we are talking about right now.

CHAIRPERSON SCHWARZMAN: Thank you.

Eunha.

PANEL MEMBER HOH: I just have a couple of comments just recently I learned -- one of the thing is that it's -- when you select the sites, is it something like -- I mean, in California that the wildfire and all this fire and responses happens, those kind of reasons are kind of could be considered for testing the groundwater or surface water over there? It may be possible some source. This is just my thoughts.

Another thing is that, you know, the -- Nerissa, the PFAS -- you know, the kinds of the PFAS -- you know, PFAS, there's so many. It's just incredible that, you know, all the labs can measure, you know, the PFAS at the very low levels. Are there -- are there -- the small chain of PFAS are included in this analysis, because I recently learned that those are really, really abundant in water source too -- in air and water, yeah.

DR. WU: Yeah. I think -- are you talking about Amina's work, because there was a recent presentation about all the C2 and C3 --

PANEL MEMBER HOH: Um-hmm.

DR. WU: -- and the prevalence in the bloodstream and trying to figure out what the source of that is. I think I have a slide -- an extra slide here. These are the analytes included in the new ECL method.

PANEL MEMBER HOH: Okay.

DR. WU: And I would refer -- hopefully, there's somebody from ECL who can weigh in on this.

DR. ATTFIELD: So the four carbon chain is the smallest that we're doing.

PANEL MEMBER HOH: Okay.

DR. WU: And sorry, to clarify your point about wildfire response, was that in terms of suggesting that we look in counties where there has been a wildfire response and if AFFF of PFAS have been used in that wildfire response that would make it a county worthy of looking at?

PANEL MEMBER HOH: Yes.

DR. WU: Yeah, that's all -- all good things to consider. But, of course, like I guess water assessment is really how we're getting at that, because that would be really the primary exposure to the population.

PANEL MEMBER HOH: Um-hmm.

CHAIRPERSON SCHWARZMAN: Thanks.

Jenny.

PANEL MEMBER QUINTANA: Hi. We're talking about water sources. But, of course, what people actually drink is the most important thing. And this is not my area at all, water, but I'm just kind of curious, do they have good data on Californians' behavior around drinking tap water? Just for a totally naive point of view, I would assume that wealthier areas would be, you know, out there

with their little filtration units, or what have you, and then the lower income areas might just drink tap water more. But I'm just kind of curious, do they have a good behavior data about water consumption, and especially how it might differ between urban and rural areas? I don't know at all. I'm just asking.

DR. WU: I think they do ask questions about water source in things like BRFSS and the CHIS statewide survey. So that would be more of a population-based assessment. We do ask that question in our CARE study. So we do have a sense of our own participants. And we did hear from a lot of people in LA, but especially in Region 2, that a -- that there was a lot of bottled water consumption. Actually -- and it wasn't like necessarily correlated with, oh, I know there's something in my drinking water, but there's more of a just a -- it's almost cultural that like don't drink the regular water. Go out and buy your water, even though it's quite expensive. And so I think in CARE, we will be using that as a way to look at how our participants' PFAS levels and their drinking water matches up. We'll be taking that into account.

PANEL MEMBER QUINTANA: Thank you.

DR. WU: Jenny, I did want to comment on your comment on rural and I think that is something that we

don't often get to. It's very hard to recruit in rural areas. And there's so many really important things, I think, to learn about rural communities. It's unfortunately not one of the data points we have in final statistics or GDSP data to be able to select for that, but I wonder if -- by focusing on Central Valley and if we can get enough numbers, we might be able to then kind of sort through our data retrospectively and figure out who is on private wells. And I think that would be really important to look at, especially in places like Tulare, where there is, you know, fire training grounds and a lot of industrial -- a lot of industrial sites.

PANEL MEMBER QUINTANA: Thank you.

CHAIRPERSON SCHWARZMAN: Any other comments, questions, discussion points on this planned program or anything else that Nerissa presented for that matter?

DR. WU: Well, thanks, everyone for the input. I mean, we just got our IRB approval and our Biobank approval, so we're really excited about this. And it's just great to have so much input into how the data will be used, but also just things we should be considering in the sampling.

CHAIRPERSON SCHWARZMAN: Great. I think Jenny had one more.

PANEL MEMBER QUINTANA: Sorry. I raised it right

before you made that wrapping up comment. I didn't mean to derail you. I just was looking at that last question about additional exclusion criteria and it made me think about your sample. Do you have -- maybe you said this and I'm so sorry if I missed it, but do you have any data on the mom, like breast feeding data, or prior breast feeding, or if their first child, first pregnancy, not the first pregnancy, because that would affect some of these --

DR. WU: For sure.

PANEL MEMBER QUINTANA: -- water fat-soluble compounds. I'm just curious. And what exclusion criteria do you currently have, if you wouldn't mind telling me again, I'm sorry.

DR. WU: Yeah. Sure. So we do have for the retrospective studies -- the retrospective sampling, we will have parity. So we'll know how many -- how many babies to term this person has had. We don't have breast feeding information, so that's why we are excluding multiparous individuals.

PANEL MEMBER QUINTANA: I see.

DR. WU: We're only sticking with nulliparous pregnancies. For the prospective screen sampling though, we don't have those birth records linked until one to two years after the birth. So we're going to oversample.

Retrospectively then, we'll be able to link to the birth record data. And we'll either -- I'm not clear how this is going to work, but our plan is to either identify multiparous samples and take those out of the queue, so we won't analyze them, or it's possible, depending on where we are with our analyses, that we'll go ahead and analyze them, and then adjust or stratify for parity.

PANEL MEMBER QUINTANA: And those were your only exclusion criteria. You didn't have others.

DR. WU: Just live singleton births, so any multi- -- multiple births --

PANEL MEMBER QUINTANA: I see.

DR. WU: -- like twins or triplets, we won't be including.

PANEL MEMBER QUINTANA: I see.

PANEL MEMBER SUÁREZ: Well, I guess I had a question related to that as well. What kind of information do you have -- additional information would you have?

DR. WU: Oh, I'm going to call in Dina, because she can rattle this off.

MS. DOBRACA: So once the linkage between the Prenatal Screening Program and the birth record occurs at GDSP, and once the data is linked, we've received approval for most of the variables on the birth certificate.

PANEL MEMBER SUÁREZ: Okay. So then I guess for the prospective, you wouldn't be -- so this is like part of exclusion criteria, who you're going to include or not, but you won't have those data out for another two years after the samples are collected.

DR. WU: Right.

PANEL MEMBER SUÁREZ: So then you wouldn't know who you -- who you would actually include into the study for another two years, right? So I'm just trying to understand the timeline here for it.

MS. DOBRACA: Correct. So because the NAPS labs only retain the samples for a month, we have to take the samples as they come. And some of those samples will not go to term and therefore will not be part of the final California birth file for the year. Some of those individuals will move during their pregnancy and therefore move out of the county of residence between their Prenatal Screening Program and when they -- their address that shows up on their birth certificate and therefore would be excluded retrospectively. And so, yeah, there is -- because of the way that the sample collection works, we can't exclude until the data is linked after the fact.

PANEL MEMBER SUÁREZ: Right. So then to reach your targets there on that slide that we have the number of samples per year, I guess that's for the retrospective

and then the prospective. I'm just looking at the -- that there. So it looks like for the prospective you're starting with 500 -- a target of 500 in 2024. To reach that target, I'm guessing that you're going to have to collect a lot more samples and then later on you're going to be doing the exclusion, right?

Is there a certain number of samples that you're targeting or that you can actually store. I guess 500 is not that much, so maybe, yeah, what are you thinking in that regard?

DR. WU: I think we'll have to calculate that based on our exclusion criteria. We can look at the county and we'll have pretty good data on the percentage that are multiparous versus nulliparous. So we'll do that calculation when we get to that point. The storage of the samples isn't the issue. I mean we do have to purchase some, so there is some limit on how many samples we can get, but we will -- we do plan to oversample, so that we'll still end up with enough samples for our analyses.

PANEL MEMBER SUÁREZ: Is there a parental occupation in the birth certificate?

MS. DOBRACA: There is -- there is maternal and paternal occupation and industry that is available as a request from the birth files.

PANEL MEMBER SUÁREZ: Okay. And this kind of

opens up the other thing that I was thinking is depending -- so something to give some thought to is there are certain groups like firefighters, of course, that have a substantially higher risk of exposure to PFAS. And the more of those you have in a sample of 500, the more that could sway things, right, and especially -- so it's something to think about whether you want to include high-risk groups within the sample. I guess you're more interested in looking at the population trend. And, of course, populations have mixes of different people, some with very high exposure and some with low. But you do have other studies specifically of firefighters if, right -- and so it's something to maybe give a little thought of is to what point you want to potentially exclude those groups that have very high exposures just to try to get a better sense of what the background exposures might be.

DR. WU: Yeah, I think it depends on what your primary study questions are and for surveillance, you know, we want -- we do want to get a population sample. But if there's enough data, at some point, sure, we can ask other questions, given all the -- all the different demographics or occupational information that we have, but -- but we're trying to stay population-based for this sampling.

CHAIRPERSON SCHWARZMAN: We have just a couple minutes here before a quick break at 2:15 and it's just a five minute break, so I want to make sure we get to Ulrike's question or comment.

Oh, you're muted.

PANEL MEMBER LUDERER: Sorry about that. I think you said that for the biobanking, only the second trimester samples are saved, is that right? So then are you planning then for the prospective study to also choose second trimester samples or, you know, is there maybe any utility? I mean, most of -- a lot of these -- certainly the more legacy PFAS, they're very, very long lived, have long half-lives, so you wouldn't expect a difference, you know, between a first and second trimester sample necessarily maybe but certainly some of the newer ones have shorter half-lives. So, you know, maybe there's some utility to looking at, you know, first and second trimester within, you know, maybe a subgroup. It's just, you know, something to think about.

DR. WU: Yeah, we would love to get first trimester samples.

(Laughter).

DR. WU: The State has just brought on a new screening program by which the first trimester samples are actually going outside of state to a different lab for

analyses. And I don't think they will be accessible to us, but it's certainly something we have asked about and have kind of on our wish list, because that -- that would be -- that would be great information to be able to get.

PANEL MEMBER LUDERER: Yeah, too bad.

DR. WU: They didn't design their program around us unfortunately.

(Laughter).

CHAIRPERSON SCHWARZMAN: José, I'm sorry. I didn't realize you were about to say one more thing there. Was there anything else? We have two minutes before we have to break. Was there anything else you wanted to add?

PANEL MEMBER SUÁREZ: Yeah. No, I guess -- I guess my question was mainly -- since the question was about what additional exclusion criteria there may be, that's what I was bringing. Would it be advisable? And I'm trying to still come up with a decision on that, whether to exclude those high-risk groups, since you do have information about parental work.

DR. WU: The high-exposure groups.

PANEL MEMBER SUÁREZ: Yes, high-exposure groups.

DR. WU: Yeah, I mean, I guess it would -- I mean, what would that tell you then? I mean, how would you compare that to other surveillance numbers, if other surveillance numbers were population-based? I think that

would be -- and where would the cutoff be? What would you consider a high risk for exposure group? So I think it's tricky and sort of a difficult thing to then figure out how to use that data once you start picking and choosing on demographics. Although, I mean, I think it's an interesting question about how those groups would compare, and certainly stratifying and looking at all your firefighters and -- you know, in comparison to everyone else would be interesting.

PANEL MEMBER SUÁREZ: I mean, it still is population-based. It's just excluding maybe very high risk groups that could potentially sway the population-level curves, if you have enough of them, right?

DR. WU: Right. And consider --

CHAIRPERSON SCHWARZMAN: I appreciate Nerissa's point -- oh, sorry. I was just going to say I appreciate the point Nerissa that we don't know what all the high-risk exposure groups are. And so that would be just sort of selecting the couple that we know, rather than, you know, maybe there's some very extreme exposures among drinkers of well water or --

DR. WU: Right.

CHAIRPERSON SCHWARZMAN: -- whatever. And we haven't -- it's not like we've categorized all of the

high-exposure groups. So it's maybe being a little bit -- it's selecting, but with our realistic blinders on that are just a function of what we know now.

DR. WU: I think it introduces a difficulty also. Let's say California numbers are lower than everyone else's. Is it because our numbers are lower or because we excluded all the high-exposure people? So I think it's -- it's difficult to interpret once you go down that route.

I do want to just highlight that there is one other exclusion criteria which is that samples that are associated with pregnancies with an identified genetic defect, those are not included in Biobank. So those are also not -- I mean, they're excluded just because of how Biobank works.

CHAIRPERSON SCHWARZMAN: We need to break now. It's just a very quick five-minute break and we're going to start right back up at 2:20. Thank you, all.

DR. WU. Thanks, everyone. That was really informative.

(Off record: 2:16 p.m.)

(Thereupon a recess was taken.)

(On record: 2:21 p.m.)

CHAIRPERSON SCHWARZMAN: I have that it's 2:20, so if we have everybody back. I will introduce our next speaker. We have a presentation now by two speakers.

Nayamin Martinez and Gina Solomon. So I want to introduce each and then we will get to hear from them.

Nayamin Martinez is the Director of the Central California Environmental Justice Network, or CCEJN. Prior to joining CCEJN, Ms. Martinez worked for the Madera County Public Health Department as a Health Education Coordinator and for 10 years was the Health Projects Coordinator for the Binational Center for the Development of Oaxacan Indig -- Indigenous Communities. Ms. Martinez has vast experience working with immigrants and residents of disadvantaged communities across the San Joaquin Valley, managing public health programs, conducting participatory research, and launching leadership and civic engagement programs. She holds Master's Degrees in both Public Health and Sociology.

Our second speaker is Gina Solomon, who's a Principal Investigator at the Public Health Institute, where she directs the Science for Toxics Exposure Prevention, STEP, Program, and the Achieving Resilient Communities, ARC, project. Her work is -- work focuses on anticipating, preventing, and responding to climate change impacts, in the most impacted communities in California. She's also a Clinical Professor of Medicine at the University of California, San Francisco.

So Nayamin and Gina will be presenting on their

plans for the FRESSCA-Mujeres project, which will include an intervention component to protect farm workers in the Central Valley from wildfire smoke.

(Thereupon a slide presentation).

MS. MARTINEZ: Thank you for the invitation to present. It's a pleasure to be here with you. Gina and I will be sharing roles here presenting. And I'll start with a first set of slides.

So next slide, please --

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MS. MARTINEZ: -- which is going to say that the PowerPoint that we have developed together reflects -- it's through a grant that we received from U.S. EPA, but it has not been reviewed by EPA. The views expressed in this document only are from Gina Solomon and myself and do not reflect necessarily those of the agencies. EPA does not endorse any products or commercial services. So thank you, Gina.

Next one.

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MS. MARTINEZ: I'll skip this slide, because you already have a very thorough explanation of myself and my background.

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MS. MARTINEZ: And I'll go and just jump ahead

and describe why the Central Valley? Many of you have been probably very familiar with the Valley, but I want to point out some of the major sources of pollution, especially air pollution, that are of concern to us in this study, but to the Central Valley residents in general.

The organization that I have the privilege of representing has worked for 22 years advancing health equity and environmental justice. And the reason why is because of why -- all the problems that we have in the Central Valley. Most of the pro -- environmental problems that our communities face are byproducts of the main economic industries that we have, starting from the left to the right. On the left you have agriculture. Agriculture is perhaps the main economic engine across the eight counties, but along with that comes all the byproducts of the uses of fertilizers, pesticides that are not only polluting the air, but also the water. Pesticides continue to be a very significant concern for community members, not only those who work in the field, but also those who live close to the fields, especially those that have not adequate weatherization and filtration in their homes, and that's something that part of our project would be addressing.

The second major, you know, concern that we have

it's in the -- reflected in the middle picture. And that is the -- all the industrial facilities. We have some of the more active biomass facilities in the state are still active in our region producing significant amounts of PM2.5. And just to highlight that the Central Valley has the worst air quality in the nation. We are in non-severe attainment for PM2.5.

And the other big culprit of that is also the oil industry. Kern County, the southern part of the Central Valley is a place here 80 percent of the oil extraction that happens in our state take place. Again, highly significant impacts on the air, and the water, and the lives of the residents of disadvantaged communities.

And although we don't have a picture for that, the one other thing that I just want to mention before I jump into like talking more about CCEJN is that in the last five to eight years, all the counties across the San Joaquin Valley had turned into the approval and placement of massive warehouses and distribution centers as an economic engine for a region causing an increase in diesel pollution in our area as well.

Next.

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MS. MARTINEZ: So in a nutshell CCEJN sites have been active for over 20 years. At the beginning, we just

only focused on organized team conferences where activists and people concerned with environmental injustices came together. But over the years in 2013, the organization finally transitioned from being a volunteer-run organization to becoming an organization with paid staff. We have offices in Bakersfield and Fresno, but we operate programs in Madera, Fresno, Kings, Tulare, and Kern counties.

As of now, one of other major milestone that our organization was able to achieve just this year was becoming an independent nonprofit. But as I was saying since 2013, we were able to have paid staff implementing projects, addressing the major environmental concerns of our region, including air pollution, pesticide exposure, water scarcity and water contamination. And, of course, oil and gas as well, especially our work in Kern County is heavily focused on this issue.

Next.

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MS. MARTINEZ: One of the programs that we most recently launched -- and I would have to say that this is really -- this was really a result of something that we did during the pandemic. In the middle of, you know, when everybody was sheltering in home, we were forced, in a way -- or not forced, but motivated to help farmworkers,

because they were considered essential workers. Yet, they were working in unsafe conditions, and oftentimes we're not -- we realized that they were not aware about their -- how all the multiple exposures that they were affecting their health that go beyond pesticides. A lot of unsafe conditions in the workplace. The wildfire smoke definitely had been affecting them. In 2020, when we were distributing masks for the pandemic, that was not the only reason. It was also that N95 masks that were needed to shelter them from the smoke and wildfires that affected our region.

So our -- one of the goals of this project is really to improve the ability of farm workers, but also residents of rural communities to understand and to identify -- be able to identify and monitor pesticide exposure, but also other forms of exposure that affects them. And based on the data that they're collecting, they transform that data into advocacy campaigns targeting the agencies or the decision-makers that are able to impact and change these conditions.

Next.

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MS. MARTINEZ: So one of the things that we have been doing since 2014 is community air monitoring network that we have been developing. Why? Because we realized

that there were only over 30 regulatory monitors across the eight counties. That did not give us real data of what was the local air quality in our communities, therefore we did not know what our communities were breathing, what were affecting their health. So through a variety of methodologies that included stationary monitors, low-cost sensors such as PurpleAir, the Dylos that measure PM2.5.

But we also are happy and able to engage residents, training them on how to collect grab samples to measure VOCs. In 2019 and 2012, we -- while doing these efforts of educating residents about air pollution, showing them how to access data from these local sensors, we hear loud and clear a concern that community members have about their exposure to air pollution inside their homes, because they live in homes with evaporative coolers or swamp coolers.

We turn around, as we always do, and transform those concerns into opportunities for changes and improvements. In this case, we approach the Public Health Institute and in partnership with Dr. Solomon and others in the Institute, that's how the project FRESSCA was created. And then a spin of that is the FRESSCA-Mujeres project that we'll be describing -- Gina will be describing in a minute.

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MS. MARTINEZ: So basically the goal of our project is to reduce wildfire smoke exposures by designing, testing, and deploying an affordable and effective filtration system for homes that have swamp coolers. And this is a picture of how a swamp cooler looks like.

Next.

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MS. MARTINEZ: We have two study locations. In Fresno County, in the -- in this particular county, we have three communities. Right now, we have been already deploying in this first year the pilot of the -- well, we deployed monitors in Coalinga. And in the future, in the subsequent years, we're also going to add the communities of Huron and Avenal. In Kern County, we have already incorporated or engaged and recruited residents in Arvin and Lamont. Arvin is a small city in the southern part of the county. And Lamont is an unincorporated community.

So the common denominator among these five is that they are mostly farmworking communities. Communities with a majority of the population being Latinos, immigrants, farmworkers.

Next.

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MS. MARTINEZ: And this is where I'll turn it over to Gina.

DR. SOLOMON: Great. Thanks, Nayamin.

So the -- the FRESSCA study, we realized that if we were going to tackle and try to reduce exposure to smoke inside people's homes that was getting pulled in by their swamp coolers, we needed some engineers. So we reached out to some folks and partnered with engineers at Illinois Tech. It seems like maybe an odd group to partner with, but they are actually fantastic and have a lot of relevant expertise and experience. And they actually purchased several swamp coolers and have been outfitting them in their laboratory. And as you can see here, there's a -- on the right an actual photo of a swamp cooler with the sides taken off, so it looks kind of like the one that Nayamin already showed, but the exterior slide -- sides are removed.

And you can see it's just a very simple machine that's just basically a fan and a blower, driven by a small motor. And then there's water in the bottom of it that gets pulled up, wicked up into pads. And then when air from outside is pulled through those pads, it cools it and humidifies it a little bit.

They're very energy efficient and very affordable, which is why they're common. They are

unfortunately a bit water wasting, which is a drawback. And the other drawback is that it turns out that those pads -- the wet pads actually don't really reduce particulate matter. So most of the PM in the outdoor air, as well as many other contaminants, get pulled in. And since the fan and the blower are quite strong, it really pushes contaminants right into the home. It's a concern that we're -- that's the concern we're trying to address.

Let's see if I can advance this.

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DR. SOLOMON: There. Okay.

So the team was actually inspired by the Corsi-Rosenthal box, which is -- some of you may be familiar with. But it's a very low cost, do-it-yourself solution to air quality. It turns out that these are just about as effective or even more effective than expensive air purifiers. They're not quite as pretty but they work well. And it's a, you know, box fan -- standard box fan and then five air filters basically, you know, sort of like furnace filters duct-taped together to make a box.

The downside, and you can see this on the lower right, is that they're -- they bring in a lot of clean -- they bring in a lot of clean air. Their clean air delivery rate beats most air cleaners, but they're quite noisy. So sometimes people don't like to use them, but we

were sort of testing against these.

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DR. SOLOMON: And so the proposed solution for the swamp coolers is actually just to basically bungee cord swamp -- filters -- MERV 13 filters to the exterior and on each side of the swamp cooler. And those will filter the incoming air and tested it out extremely well in the laboratory.

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DR. SOLOMON: And then we tested out -- this shows what they did in the laboratory in terms of particle removal efficiency, which is quite good.

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DR. SOLOMON: And then we went to the two areas that Nayamin pointed out in Fresno County and Kern County and worked with CCEJN, recruited 30 homes this past summer and did pilot testing in those homes to show -- to demonstrate the potential for the project to work. So we kicked off with community meetings in each town in April and then again went back for community meetings in October.

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DR. SOLOMON: We divided up the homes. We actually intended to randomize, but it turned out that there were some homes that we couldn't randomize, because

the design was such that we couldn't outfit with the swamp cooler filters. So we ended up then randomizing those to either a commercial air purifier or a box fan filter. And we installed -- you can see here Ruben from CCEJN on the upper left installing a PurpleAir monitor outside a home. We also installed them inside every home.

And Gustavo and Gabby from CCEJN in Kern County on the right at a home where they're looking at the swamp cooler filters that had just been installed and some community -- one of the community meetings we had in Coalinga, we pilot tested our questionnaires and we also used different types of -- tested out different kinds of data loggers, so that we would know when people were running their swamp coolers and the other equipment versus not running them.

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DR. SOLOMON: And then this shows the solutions that we tested out, the swamp cooler filter, Levoit 300 Air Cleaner, and then a box fan filter. We tested out actually a couple things. We tried the big Corsi-Rosenthal boxes, but many of the homes in our study were very small, many were about 900 square feet, many were manufactured or mobile homes. And so those big Corsi-Rosenthal boxes were too big to accommodate inside the home, so we were using a different solution that was

selected -- suggested by some of our colleagues at U.S. EPA. That gives you a sense of the numbers in each category for this past summer.

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DR. SOLOMON: And just to give you a little bit of a sense of the participants, if -- really everybody completed their consents and their questionnaires in Spanish. Most of them felt most comfortable doing it verbally in a face-to-face interview. Almost 80 percent worked in agriculture, either in -- as farmworkers directly, or in food processing, or some aspect of agriculture. The rest in construction, some other things, home health, were a few folks.

And then people obviously did not have HVAC systems. They -- some of them had both swamp cooler and a window air conditioner in a bedroom. But the cooling was really by swamp coolers. And then you can see here more than half were either a mobile home or a prefab home. And a minority were -- lived in constructed homes.

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DR. SOLOMON: And so we're still analyzing all the -- we have huge amounts of data from this past summer. We're in the thick right now of analyzing everything we've got and redesigning, tweaking, reevaluating the questionnaires and so forth. We're going to be refining

the protocols and then launching, again in the spring, to do more homes next summer.

We did get an additional grant. You can see here from the bottom from the California Breast Cancer Research Program to add an element to this study. So instead of just indoor and outdoor air monitoring, we will now, in the FRESSCA-Mujeres study be looking at some indicators that are related to health. So we're going to be focusing on farmworker women in these -- the homes. We'll be looking at biomarkers in urine of oxidative stress and inflammation done through a lab at NYU in New York. We'll be looking at those at two time points, one is in the sort of late spring, early summer before the wildfire season. And then again in the late summer or fall time period. As the -- you know, during the wildfire season we'll see. I mean, we don't know if there will be a wildfire, so that's always a question mark.

We'll also be collecting saliva samples for analysis at the Blackburn Lab at UCSF. For a measure we were sort of interested in this issue of cumulative impacts, biological stressors from both environmental and social stressors. And so we're looking at telomere length in this population, because that has not been collected. And that's basically -- as you may know that telomeres are basically the caps at the end of people's chromosomes.

Those shorten with age and shorten at a faster rate in some people than others, which has partially to do with genetics, but a lot to do with the environment and the stressors in people's lives.

And the shortening of telomeres, you know, once they get too short, the cell can no longer divide. So there are associations with multiple different health endpoints. And so we also were -- have some elements really social elements to this study. We're working with an entity called StoryCenter in Berkeley. They do storytelling workshops in communities and we'll be doing these in both communities to do digital stories of farmworker women to talk about smoke exposure, breast cancer concerns, and general health concerns in their communities. And so we're looking forward to collecting both quantitative information and also qualitative information, as part of this FRESSCA-Mujeres study.

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DR. SOLOMON: And so we will be overrecruiting a little bit. We -- as you may have noticed on a previous slide, we did lose some homes in our pilot study, so that gave us a sense of the attrition rate. The reason we had some attrition this past summer, one participant moved and then three participants had unfortunately had their swamp coolers break. These machines are not super reliable.

They do break down sometime. And in some cases, they just decided to manage with window air conditioners instead. So we lost some homes. So we'll be recruiting 58 participant homes this summer approximately, in the hopes of ending up with at least 50.

We'll be focusing on homes of non -- you know, where nobody smokes in the home. Everybody has an evaporative cooler, where there are women agricultural workers in the homes. We'll be testing the filter on the swamp cooler, the evaporative cooler, versus another intervention. And we're actually trying right now to -- which of the two, the box fan or the commercial air cleaner is the best to use next summer. We're not going to be testing both as will our power calculations indicate that we won't really be able to have a three-arm study.

We'll be asking a lot of questions about household and occupation, respiratory symptoms, breast cancer risk, and information about what people know about wildfire smoke hazards.

We'll be doing PurpleAir monitoring and then very extensive indoor and outdoor testing, if there's a smoke event, including for volatile organic compounds, PAHs, metals, deposition, testing for particulate matter in addition to the -- you know, the testing that we're doing with the PurpleAirs. And then I think I saw Jeff Wagner

is on this call, he's going to be doing some detailed characterization of the particulate matter and the PAH testing as part of this study. He's part of the -- both the current FRESSCA and the FRESSCA-Mujeres study.

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DR. SOLOMON: So there's -- and I know he's also very involved with Biomonitoring California as a good bridge.

So this gives you a sense of -- here of a potential biomonitoring component. So we've been working with OEHHA to think about -- since we're already going to be in the field, we're already going to be doing urine sampling in the spring and in the late summer or fall. And we were already planning to do one sample at each time point, but we could -- you know, it's not that hard to do additional urine samples. So we were looking at adding some additional urine samples for biomonitoring.

In particular, there are different ways we could do this, but we're thinking about doing a morning and evening sample to capture, since these are farmworkers, they will have outdoor exposures in the fields at work during the day, and then we hope there might be some recovery time at night with the benefit of the indoor air quality filtration.

So if the filtration works, it will basically be

reducing people's exposure from a 24-hour -- 24/7 kind of situation to significantly less than that. And we may be able to back that up with biomonitoring.

We're looking at, or talking about, potentially including PAHs, VOCs, and some metals that are associated with wildfire smoke, but we're interested in input on that. The PAHs, I think, are the most definitive as -- and clearly linked to wildfire smoke exposures.

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DR. SOLOMON: So some of the questions that we have for the SGP, we'd love to put on since we're right now in the process of putting together the protocols for next summer. We are -- you know, we're a little -- recruitment could be a challenge. We're looking for certain types of swamp coolers that we know that can fit with filters. We're looking at people who work as farmworkers or maybe just outdoor workers, in some cases. Would that be, you know, a feasible option to broaden recruitment?

And then should we be looking at doing sort of spring and fall sample collection or another alternative would be sampling just before we install the filters and then, you know, shortly after the -- the filters are installed in people's homes.

And then we're also struggling right now to

develop all the questionnaires. Lots of things that might be relevant to ask, but we're always interested in input on specific questions that might be helpful to ask in this population.

So I think that's the --

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DR. SOLOMON: -- that's the presentation. I did want to thank our project team. So I've mentioned -- you know I'm with the Public Health Institute. We also have folks from Tracking California, Paul English and his team. We're also with the Public Health Institute. A large team from CCEJN. A great group from Illinois Institute of Technology. Jeff Wagner as well from CDPH. Kazu Kumagai has also been a -- an advisor to the project. And then a number of other technical advisors, John Balmes, Shelley Miller, Brett Singer advising on different aspects of the project, and now Biomonitoring California, and UCSF some additional UCSF folks, Peggy Reynolds and her team on the biomonitoring piece. So it's a great group and it just seems to keep growing.

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DR. SOLOMON: I just want to make a plug for Kern County. They're is a truck parked in Lamont that has the best raspados that I have ever tasted in my life. So if you're ever down in Lamont and want to enjoy the most

wonderful fruit, tamarind, and chili drink you've ever tasted -- fruit, mango, chili, tamarind drink you've ever tasted, it's worth the journey.

So that's all and I will stop sharing and be happy to take questions.

CHAIRPERSON SCHWARZMAN: Great. Thank you both, Gina and Nayamin for that presentation. It's a super exciting project.

We have 10 minutes now for clarifying questions from both the Panel and the audience. And then we'll have a half hour discussion -- open discussion.

So, Tom.

You're muted, Tom.

PANEL MEMBER McKONE: Yeah. Sorry. Now, I'm off mute, right?

CHAIRPERSON SCHWARZMAN: Yes.

PANEL MEMBER McKONE: Okay. Fascinating project. I just wanted to congratulate all of you on -- it's just a great team. You know, your partners on the air filters are great. You know, getting advice from someone like Brett Singer who I've worked with for years. He really knows what he's doing on filtering.

I guess there are -- there are some technical questions and I have some thoughts about your questionnaires, but I think I'll hold that off maybe to --

we're going to have a deeper discussion later on. This is more clarifying, right.

CHAIRPERSON SCHWARZMAN: Yes, that's right. Clarifying questions now.

PANEL MEMBER McKONE: So I'm not going to offer my comments yet about what might be in a questionnaire, or could.

But I guess what I was curious about first in developing the filter system for the swamp coolers. I mean, you settled on a -- on a MERV 13 and there's definitely an advantage of 13 over 11. And we saw that in the figure -- I don't know if you want to bring that back up.

But then there's also like MERV now 14, there's MERV 16s. And I know -- I mean, I did something similar in my own house with a whole house. We have -- we have a furnace with a filter slot. But, you know, was there a question about which -- how to optimize the filters to not like put too much stress, you know, on the swamp cooler, but also get effective cleaning, or was it just that you pretty much thought MERV 13 was probably the way to go.

DR. SOLOMON: No, that's a great question and I didn't want to get detailed with the filters, but it totally makes sense. And by the way, Brett has been amazing and he was the one who introduced us to the IIT

team in Illinois. And the team tested out a lot of different filters on these swamp coolers. They purchased two models for work in the lab that represented a bit over 5-0 percent of what we found out there in the communities on a survey.

And they tested out filters that would have been -- I can't remember whether -- I think they did go up to MERV 16. And unfortunately the motors on these swamp coolers and the fans are -- the motors are not that powerful. And so what was happening was it was really choking off the swamp coolers and the flow just tanked. And so they had to balance it.

And the problem with the MERV 13 that we're struggling with right now is that there is -- at the -- in the smallest particle sizes, which is what you expect -- there is actually a fair amount of particulate matter that gets through. So they're not perfect. We're actually in a conversation right now on the team about whether we want to stack interventions, you know, basically is have the filters on the swamp coolers and also have an air cleaner inside the home to basic -- and this is --

PANEL MEMBER McKONE: Okay.

DR. SOLOMON: -- Brett Singer's suggestion. And we're checking out our end to see if we could make that work. I think it might be optimal.

We also were trying to think about affordability. We did -- we ended up using Rensa 4-inch thick filters with carbon, so that -- you know, to attempt to capture VOCs in addition to trying to capture particulate matter.

We heard from Nayamin and the other CCEJN team, and you heard this too, concerns about pesticides. All the photos Nayamin showed of the -- of those -- the other pollution sources were taken from the backyards of people's homes in -- who are enrolled in this study. So they're -- you know, these are very real other exposures. And so we're trying to see if we could reduce VOCs and PM -- but, yeah, it's a -- it's a challenge.

PANEL MEMBER McKONE: Just a response. It's a data point of one. But I have a PurpleAir indoors and outdoors. And I have a whole house 4-inch MERV 13 in our furnace, so we can run it in fan mode. During the worst fires, we saw an enormous reduction. We were getting 60 -- the air quality index would be 120 outside here -- I mean, this is in Albany Berkeley area, and indoors we were down in the 70s. I mean we were getting phenomenal reductions with just one whole house MERV 13 -- I mean a 4-inch MERV 13 running on a whole house fan.

So, I mean -- you know, I mean, that again that's a data point of one, but it -- they're pretty effective. And we have the same problem. I mean, we couldn't go to a

16 for our house, because it would be too much stress on the fan motor for the furnace.

DR. SOLOMON: I think one other positive thing just to toss in, is that in -- when you run a furnace filter, there's always the concern about intrusion through cracks, because most houses are negatively pressurized and so outdoor air just sort of leaks in. The nice thing about a swamp cooler is since it pushes so much air in through the sample cooler, the houses are positively pressurized and we tested that. And really it was true in all homes, so in other words, air is going out through any cracks. And what that means is if you can filter the air coming in through the swamp cooler, it's not going to -- smoke is not going to get in through other cracks and crevices.

PANEL MEMBER McKONE: All right. Well, thank you very much. You addressed my -- but I have more issues we'll bring up later when we have more time for a discussion, particularly on the questionnaire.

CHAIRPERSON SCHWARZMAN: Great. Thank you.

PANEL MEMBER McKONE: I mean, you wanted some input on the questionnaire. Okay. Thanks.

CHAIRPERSON SCHWARZMAN: Yeah. So questions for now and then we have plenty of time for discussion.

Jenny.

PANEL MEMBER QUINTANA: Hi. Thank you, Nayamin and Gina for a great presentation about a great study. Since these individuals participating are -- sounds like quite often working in the fields -- the open fields during the day, have you -- do they -- are they counseled to wear masks? I know it's very hot to wear that or -- are there -- is there any kind of protection they could put on during the day, since they're so exposed outside to the smoke?

MS. MARTINEZ: Yeah, that is a program or a campaign that we have implemented, an educational campaign along with distribution of N95 masks. In the year of the pandemic, we were able to -- we were just distributing COVID relief cash assistance and we were asking, did you receive this, because you have the right, the obligation of the employers to give you this, because air quality is hazardous, blah, blah, blah. And the response of almost everybody was like, no, I have not received one. So that's how we started, not only did we -- we surveyed 201 farmworkers. And then based on that, we did like a little intervention. We have a wallet card that is in Spanish and has a lot of visuals and has the employer obligation, what the air quality is and how to, you know, go and check it out.

We have them registered to receive text alerts,

so that they could know when the air quality is bad and then we give them the N95 masks. However, the -- you know, the flip side of that is that they have told us that although they understand that they need these for their protection, it is very uncomfortable, and that they feel they are choking, because the wildfires can happen here in the Valley when we have the heat as well.

So imagine wearing that N95 mask, trying to do physical activity, and in the hundred plus degrees. So people definitely are struggling to follow the advice, although they know this is for their protection is really, you know -- it's really difficult to follow. And some frankly told me, you know what, I won't wear it, because -- especially those that are working by contract, they get paid the more that they work. And wearing the mask they had -- they had to stop to take breaks, and it was kind of slowing them down. So that's the struggle that right now we are following between what the best practice should be and what the reality of its applicability is on the ground.

PANEL MEMBER QUINTANA: Yeah, they really need a supplied air hood. They're trying to get some very low-cost ones in the medical field. Actually, they're trying to work on these very low-cost supplied air things that don't make it so hard to breathe, you know.

MS. MARTINEZ: Either that or really not working and being able to stay, you know, indoors or --

PANEL MEMBER QUINTANA: Yes, better.

MS. MARTINEZ: But that then the problem is how are they going to pay the bills? If they don't work, they don't get paid, so it's not an easy solution.

PANEL MEMBER QUINTANA: And I'm just curious, are you collecting house dust as part of this study, because it's a very interesting kind of record of pollution in a home.

DR. SOLOMON: We don't have a plan right now to collect house dust, though it's funny you should ask, because we've added -- Nayamin and I had a conversation about that and we're trying to -- yeah, we could always collect it and then -- and then save it for potential future analysis. So thank you for that suggestion. We'll look into that more.

PANEL MEMBER QUINTANA: And my very last question, I'm just curious if there's children -- commonly children in the home or not, because that would be another highly exposed population that if you're getting urine samples maybe something to think about also collecting those samples.

Thank you.

DR. SOLOMON: There are children in many of the

homes, not all, but we -- this -- we -- this study is focused on women and -- you know, the -- because of the funding from the California Breast Cancer Research Program, we're really focused on women farmworkers.

We don't have -- we haven't gone to our IRB to seek a -- you know, permission to recruit children. So thanks for that suggestion. It is something to think about.

PANEL MEMBER QUINTANA: They're baby women, some of them.

CHAIRPERSON SCHWARZMAN: José.

PANEL MEMBER SUÁREZ: Yeah. Very nice presentation. So you're interested in testing this intervention and you're still tailoring a little bit what the intervention -- the final intervention is going to look like. And so you're looking at 58 participants. Is this going to be a 50/50 split of the intervention or what are you envisioning?

DR. SOLOMON: Yes, possibly. We may have -- we may be more like 30/20. Really trying to get a feel for that -- the swamp cooler filters. So if we -- if we could outfit, you know, more than half, we will. We've had some issues with -- swamp coolers are complicated. I had no idea. So it turns out they come in a lot of different shapes and sizes. And so I mentioned that our team has

figured out strategies that work for, you know, more than 50 percent of the side-mounted swamp coolers that are out there. But there's a lot of different types. And so if we have trouble recruiting, we end up with some that we can't use. We'll have to put those in a control arm and so that we'll need to determine how we do that.

PANEL MEMBER SUÁREZ: And your thought for the control arm would be --

DR. SOLOMON: And then in some cases, people -- like the swamp cooler breaks, they buy another one of a different type.

PANEL MEMBER SUÁREZ: Oh, yeah, well, I guess two follow-up questions with that. So one of them -- so you mentioned that there were a couple of participants whose swamp coolers died. Was that kind of as a result of the filter you think? Was there something of that sort? Do you have any thoughts in that regard?

DR. SOLOMON: Of the ones where we had -- where we had put the filters on. In a couple cases, the swamp coolers broke before we even -- after we had recruited the participants in April, but before we outfitted their homes, which was in July.

And then in a couple cases, they were control homes. So, you know, they weren't -- they -- none of them had filters on them, so we don't think we actually damaged

any swamp coolers in our -- fortunately.

PANEL MEMBER SUÁREZ: Okay. That's good. And so I guess I have a question about -- so you're doing some biomonitoring. You're collecting urine only, I believe, right?

DR. SOLOMON: Yes, that's correct, and saliva for the telomere length.

PANEL MEMBER SUÁREZ: Okay. And so then you're -- I'm just looking at your question for the SGP about the timing of these collections versus one would be seasonal versus pre-post filter installation. I don't know if this is a good time to have a discussion about that or if I should hold off to that until --

CHAIRPERSON SCHWARZMAN: No, I think we're just going to do clarifying questions now and we have a good chunk for discussion.

PANEL MEMBER SUÁREZ: Okay.

CHAIRPERSON SCHWARZMAN: Thank you.

PANEL MEMBER SUÁREZ: Okay. So then -- just my final question is -- okay, so I mean, like, you're still working on what the control intervention would look like, it sounds like. And it will be something that's beneficial, but you're still working -- okay. So I don't have too much --

DR. SOLOMON: Yeah, the -- we're open to advice

on that. Part of the trade-off is the participants really like the commercial air cleaner, the Levoits that we used. They -- you know, they're nice looking. They're quiet. They definitely, for the most part, tended to just use them and leave them running, which was nice. The box fan filter sometimes ended up in a closet or not used very frequently, though that would probably change if it was really smoky.

The box fan filters are obviously much more affordable. So we could, you know, purchase those for every home if we wanted to without too much difficulty. So we're weighing the trade-offs there with the interventions. And the box is so far from the preliminary data, it actually looks like the homes that used the box fan filters, the air quality actually looked a bit better. I mean, it really -- they seemed to work extremely well.

PANEL MEMBER SUÁREZ: Thank you.

CHAIRPERSON SCHWARZMAN: Ulrike.

PANEL MEMBER LUDERER: Thank you. Thank you. That's such a great study and thank you for a wonderful presentation, both of you.

I have a couple of questions about the swamp coolers, which is probably just related to my ignorance about swamp coolers, but you mentioned the pads do they have to be changed regularly?

DR. SOLOMON: (Nods head).

PANEL MEMBER LUDERER: Yes.

DR. SOLOMON: They have to be changed every year.

PANEL MEMBER LUDERER: Um-hmm.

DR. SOLOMON: And so one of the things that we have as part of the study, I should -- I probably should have mentioned it is we -- we're offering that as a free service to all the study participants regardless of whether they're in the control arm or the study arm. And so we contracted with HVAC companies in each of our study locations to go service -- professionally service the swamps coolers, which involves a number of different things, and, you know, cleaning them, changing out the water, making sure the pump works well, and changing the pads.

Yeah, that's all important, though we actually had trouble with some of the HVAC companies. So we're struggling with getting this done fully enough, but we're planning to do it in some form next year as well.

PANEL MEMBER LUDERER: And then so kind of a related question, you know, I think about wet pads. I'm not sure exactly what the material is, but, I mean, do they have problems with mold, which is obviously another air contaminant?

(Laughter).

DR. SOLOMON: The most common kind of pad is Aspen. And it's sort of a woven wood basically shredded material, though some have cardboard, and then some have this sort of blue, I don't know what they're made of, but they're some kind of synthetic pad. So there are multiple different pads out there on the market.

PANEL MEMBER LUDERER: Um-hmm.

DR. SOLOMON: I don't know about mold growth on the pads, but we're very concerned about mold growth on our filter interventions.

PANEL MEMBER LUDERER: Um-hmm.

DR. SOLOMON: So for that reason, when we collected the filters from the homes, they're now -- one filter from each of our participant homes is now in Jeff Wagner's lab. And he's going to be doing microscopy to evaluate what's on that filter, and that will include looking for evidence of mold growth. There was some dampness of some of the filters and we just want to make sure we're not creating a problem.

PANEL MEMBER LUDERER: That is great.

And my last question is the questionnaire -- and maybe you said this and I missed it, but is it going to be one time or are you going to do them, you know, like in each, you know, sampling window? Have you decided that yet? Maybe you're still thinking about it.

DR. SOLOMON: So what we did this past summer was one set of questionnaires in late April, beginning of May when we recruited the participants, and another set the first week of October when we removed our study interventions, the filters and so forth.

And then in the interim during the summer, we did periodic, very short sort of check-in questionnaires. We're -- the Biomonitoring California team pointed out to me that we'll need to actually ask biomonitoring-relevant questions at the time periods when we collect the urine samples. So we're going to rethink the timing of our questionnaires and which we do when. It's probably a good thing, because when you stack all those questions on at once, it can become a pretty long interview. And so it may work better to have different questionnaires at different time periods.

PANEL MEMBER LUDERER: Thanks. That was -- yeah.

DR. SOLOMON: Yeah, and we're open to -- yeah, and we'll -- we're working that out. Any input you have on that would be welcome.

PANEL MEMBER LUDERER: Thanks.

CHAIRPERSON SCHWARZMAN: Thanks. I just want to note that we have until 3:30 for our discussion. And so that's just 20 minutes from now, so maybe we could keep the questions kind of focused and leave enough time to

provide the study team with some input.

José.

PANEL MEMBER SUÁREZ: I forgot to lower my hand from earlier.

CHAIRPERSON SCHWARZMAN: Okay. Thanks.

Eunha.

PANEL MEMBER HOH: Yeah, my question is going to be quick. Just a clarification about the -- you mentioned that you are -- you are going to test the VOCs and PAHs and metals. And can you just clarify which samples you're going to measure? And then in your questionnaire, is there any question about kind of noise kind of concerns, anything like that?

DR. SOLOMON: Yes. So on noise, we actually ask a set of questions at the beginning and the end of this study currently that -- again these -- this was our pilot year and we were testing out questions, so we'll be making some refinements, but we ask about what people -- about concerns people have about their indoor and outdoor air quality, and then we ask them about whether they like their cooling system. And what -- if they don't, what issues bother them and noise is one of the questions there. But we -- we definitely need to ask a bit more about that, I think.

And then in terms of the sampling, so there's the

environmental sampling. And Jeff, since you're -- I don't know if you want to talk a little bit about what you're planning. The environmental sampling is largely going to be triggered by a wildfire event, if -- if we have a smoke event, we're going to be out there doing pretty intensive sampling to collect material. And, Jeff, I'll let you respond -- talk about that a little bit.

DR. WAGNER: Sure. Yeah, thanks. We are definitely still in the planning phases as far as the details of particularly flow rates and sample durations, which will be important. But the current plan is to use sorbent tubes for gas phase VOCs and mixed cellulose ester filters for metal analysis.

CHAIRPERSON SCHWARZMAN: Great. Thank you.

Jenny.

PANEL MEMBER QUINTANA: I'll try to be very quick. This is really a clarification question. So it sounded like you're taking away your intervention you just said, so that you're going to remove your intervention. I'm just wondering why you would remove it and not try to leave -- leave your intervention there and leave the PurpleAir and things like that. And then my second question is I thought there was not a control per se. I thought there was just going to be before and after the intervention, but maybe I -- then you kept using the word

control, so do you have controls not getting anything, and if so why? Why wouldn't you have -- just have a delayed onset getting the intervention?

DR. SOLOMON: I'm so sorry, yeah, that was unclear. What I'm calling controls are the ones that don't have the swamp cooler filters, but instead either the air purifier or the box fan.

PANEL MEMBER QUINTANA: That's what I thought. Okay.

DR. SOLOMON: We don't have a no-intervention control. We did end up having two homes with no intervention this summer, because we had set them up with PurpleAirs, and then they -- for a variety of reasons, they either didn't use the box fan at all or were -- in one other home, we just weren't able to install anything, but we had the PurpleAir data, so we ended up with two homes with no intervention. That was not intentional to be honest. And this coming summer, yeah, that we'll have data pre- and post-installation of the filters.

So wait. Let's see -- so your other question was about -- I'm sorry.

PANEL MEMBER QUINTANA: Why you would remove -- did you say you'd --

DR. SOLOMON: Why we'd --

PANEL MEMBER QUINTANA: -- remove your

interventions?

DR. SOLOMON: Yes.

PANEL MEMBER QUINTANA: Why wouldn't you leave everything in place?

DR. SOLOMON: Yeah. So in the fall, people stop using their swamp coolers. They turn them off. They usually drain the water and cover them, and so the filters really have to come off. And in addition, we discovered that, you know, in time the filters start to degrade. There's sunlight. There's dust. There was some -- you know, it starts to rain. And so for all of those reasons, we can't leave those filters on.

The PurpleAirs, the EPA requires a lot of quality assurance of their grantees. And so we actually did pull back the PurpleAirs after this summer to do side-by-side -- you know, to do testing to make sure that they are ready for field deployment again next summer.

We only pulled back the indoor air PurpleAirs and the outdoors are gifts to the community. So we have three outdoor PurpleAirs installed with the data, you know, publicly available in each of our study communities.

But, yeah, so afterwards, I don't know if people will want to keep the indoor PurpleAirs, but we would offer it to folks if they want at the end of the study. We also are not sure if we're going -- the participants

from next year will be enrolled again this year. It was a one year assent and we're going to be going back and reconsenting and sort of, you know, for year two.

And then with the --

PANEL MEMBER QUINTANA: And then what about the filter rate, filtration, the air filters?

DR. SOLOMON: -- the Levoits and box fan filters, we are giving those to the participants --

PANEL MEMBER QUINTANA: Okay.

DR. SOLOMON: -- who were assigned those.

PANEL MEMBER QUINTANA: Okay. Great.

DR. SOLOMON: We're replacing the filters, because in most cases they were pretty dirty. So we pulled them back to the CCEJN offices. We are swapping out the filters and then giving them back to those folks.

PANEL MEMBER QUINTANA: Thank you.

CHAIRPERSON SCHWARZMAN: Great. I just want to check in with Cheryl. I want to see if there's any questions that we need to highlight from webinar attendees or the public.

DR. HOLZMEYER: No. No new questions. Thank you.

CHAIRPERSON SCHWARZMAN: Okay. Great.

In that case, we can turn it over to the discussion and all the input you all were sitting on to

provide for this study.

I know that José had suggestions about the questionnaires. Do you want to start with that?

PANEL MEMBER SUÁREZ: It was actually about the biomonitoring -- the timing of the biomonitoring. So I just had a question there. Well, when should -- what's the timing? Should it be spring, or summer, or fall or the pre- or post-installation? My thought would be probably focusing on the wildfire season, because that way you'll be more -- I mean, they'll be -- you'll be able to see more differences, right? Because my understanding is that your objective is to look at the differences between one intervention versus the other intervention, right?

So you'd see the biggest difference, the biggest change overall during those high-exposure periods, because that's when most of the intervention will really be most effective ultimately. So my thought what is -- I liked the idea of having the pre-, post- during the wildfire season, so then you can compare how much change there was across both of the treatment groups during a period of high exposure, and then -- you know, I guess that would be my initial thought and recommendation.

CHAIRPERSON SCHWARZMAN: Thanks.

Tom.

PANEL MEMBER McKONE: Yes. I guess -- I -- and

this -- I have a thought about like locations, and maybe you've already thought this through, but if it is through the questionnaire or survey, because you may have alluded to the fact that some people use the swamp cooler only in like a bedroom or one room and maybe others have a whole house version. And the same may be true of the filters, they may move it around like the -- I mean, I'm talking about the Levoit-type mechanical or the box one. But I don't know if through the questionnaire you can elicit like exactly where the effect is going to be. So if somebody has a swamp cooler only in their bedroom, they may not get a lot of benefit, and you probably will see that with the PurpleAir, depending upon where it's located.

But I'm just wondering if you're going to use the questionnaire to get a sense of where people are locating the air cleaning -- or where the air cleaning effectiveness will be targeted, like more whole house in some cases, more single room, and how you might elicit that. I mean, something to think about.

DR. SOLOMON: Thanks. That's a good question. The swamp coolers that we saw, every single one of them went to the -- sort of a common room. You know, often it was sort of a combined living, dining, kitchen area. And so I didn't -- we didn't actually see any swamp coolers

that went to bedrooms. And then it was not unusual for some of the bedrooms to have window air conditioners, though that was not true in all the homes, though we -- you know, that -- that's a whole other variable. We have schematics of all the homes with the locations of the swamp cooler outflow, the location of the PurpleAir and whether there are other cooling -- you know, like in a window AC. We -- since the swamp coolers were all in the common room, all the PurpleAirs went into the common room area as well. Trying to put them as far from the kitchen area as possible. But since these were small spaces, we are picking up a lot of effect from cooking.

PANEL MEMBER McKONE: Yeah, if I could just follow up, because the cooking was another issue about -- I mean, I watch PurpleAir in my neighborhood, just the -- and it's really amazing, at meal time, there are houses around here that will go off the charts, even when the, you know, the outdoor air quality is, you know, 15 or whatever, really good. And then you'll see the indoor ones at night just jump, because some people are really -- as soon as you start frying foods -- so depending upon how they cook foods, it's going to send the PurpleAirs right off the chart. And I guess you can at least watch for that or ask them what they cook, because it really is dependent on how they cook their food and if they're

frying things. If they're using cooking oil, high temperatures, they're just going to be generating -- you know, they're going to get up to 150 without much effort.

DR. SOLOMON: Yeah, that's definitely true. And a minority of the homes had -- had stove hoods that functioned, so -- and, you know, that is something that we see in our data. We do see cooking effects. And we're trying to correct for that. And it is -- it is going to be an issue potentially with the biomonitoring that we're also thinking about. I'm not quite sure how to solve that.

CHAIRPERSON SCHWARZMAN: I have a quick question and then I'll get to Ulrike next. Will you remind me what the -- what your assessment is of outdoor exposure? There was timing of urine collection that was meant to capture exposure outdoors, as opposed to exposure indoors. Can you remind me what that was?

DR. SOLOMON: So one -- one of the possibilities that we've talked about is doing morning and evening, so -- actually the opposite, evening and then morning, so doing after a workday, collecting urine sample, that could then actually potentially be frozen in that person's home freezer overnight, get a first thing in the morning sample, after the person has been, you know, one hopes receiving the benefit of the air quality intervention

overnight, and then pick both up and freeze them at minus 20 shortly after that. So that would be one approach.

And that could be done, you know, before any wildfire event happens to sort of capture baseline potentially and then maybe during a wildfire event. Of course, we don't know for sure if or when we would have a wildfire, and -- but if we do, then, you know, obviously that would be a perfect way of maybe getting that sense of what's -- what -- where people are getting their exposures.

And then the other option would be to look just before and just after we install the filters. Then the question is are we installing during a wildfire event or are we installing just sort of on a perfectly nice day, at which point we might not see very much. So there's a lot of things we're struggling with right now as we refine the design.

CHAIRPERSON SCHWARZMAN: Thank you for that. I'm very intrigued by the idea of collecting -- if you're looking at these -- at farmworkers and/or I support if you -- if you're having any difficulty with recruitment, certainly including other outdoor workers. I think it's very intriguing and potentially very useful from a public health standpoint to be able to catch that evening urine followed by morning, because, you know, the intervention

in this study, of course, is in the home, but that could potentially generate really useful data for other kinds of interventions.

I'm sure you're aware of the work that Cal/OSHA is doing around a respiratory protection standard for wildfire, wildland firefighters, and for that, you know, it's a technology-forcing regulation and there's developing PAPRs that are appropriate and usable by firefighters in wildland settings and the WUI settings. And the idea that ultimately like gathering data on exposure -- outdoor exposures for farmworkers could potentially inform a similar kind of standard for agricultural workers who have to work during wildfires or something. It's tantalizing the idea that you could generate a little bit of that data that's not specific to the intervention here, but might also be really meaningful from a public health perspective.

MS. MARTINEZ: I think that idea is great and although definitely separate from the project. I do want to clarify that being a farmworker is not a criteria for participation. It's just basically the type of swamp cooler, that they have a swamp cooler that is functioning and all that. However, the reality is that a lot of the people who live in these homes that we're recruiting, that's their main occupation, but it's not the only one.

And we are not, you know, necessarily saying you have to be a farmworker for them to participate.

CHAIRPERSON SCHWARZMAN: Great. Thank you so much for that.

Ulrike.

PANEL MEMBER LUDERER: Yeah, so I have just a -- kind of a comment and question about the questionnaire, and sort of related to what Tom was talking about with the, you know, cooking as a source of PM, pollution inside the home. You know, in your questionnaire, are you going to be asking about -- you know, especially if you're doing -- I mean, you know, to try to get a sense of what other exposures, you know, might be. I noticed that there was like a barbecue grill I think in one of your photos if I wasn't -- you know, are you going to be asking kind of about use of those devices, you know, around the time when there -- you were doing the sampling. Fireworks. You know, people like to set off fireworks, things like that, you know, that might contribute to, you know, PM readings maybe in your -- well, I guess you don't have outdoor ones everywhere, right? You said you just have them kind of distributed in the community, is that right? So it wouldn't really affect the outdoor readings, but it might affect the indoor readings.

DR. SOLOMON: Yeah. We have roughly three

PurpleAirs in -- you know, distributed around each of our communities, so it's not every home.

Yeah. We ask questions about burning candles, burning incense. We ask questions about smoking sort of beyond the recruitment, you know, making sure that -- you know, there's no smokers in the home. And then we definitely ask questions about -- and tested people's stove hoods if they had stove hoods. We asked about whether they use them.

But we didn't ask -- and then we observed things like, you know, wood piles, outdoor tortilleras, you know, because there were people who actually had -- obviously would, you know, cook outdoors.

PANEL MEMBER LUDERER: Um-hmm.

DR. SOLOMON: And then -- yeah, and barbecues and things like that. So that's all -- we didn't think of fireworks.

PANEL MEMBER LUDERER: Yeah, during the pandemic, they became infinitely more popular, at least where we lived, so...

All right. Well, thank you.

CHAIRPERSON SCHWARZMAN: Great. It's just about time to wrap-up, but Jenny I want to get your question or comment in and then we'll move on.

PANEL MEMBER QUINTANA: Sorry. I'll try to be

very quick. Again, thank you for your answers. I'm just wondering for the questionnaire, if you ask about cleaning, either behaviors or equipment, like do they sweep with a broom? We often see a big huge spike with sweeping and sometimes vacuums that don't have HEPA filter. Also, pets can also really stir up the air, and so do you ask about pets in the home?

Thank you.

DR. SOLOMON: Yes, we asked actually I think about all of those things. We asked about sweeping, vacuuming, pets, and -- indoor pets. Yeah, a lot of the homes had out -- pets in the yard, who didn't come into the homes, but it was -- so we had to -- we realized when we asked about pets in the first questionnaire, we missed that distinction, which is important. So now we're specifying really indoor pets, so, yeah, we'll -- I think we'll be covering all of those issues.

CHAIRPERSON SCHWARZMAN: Great. Thank you so much. Nayamin and Gina, it's really fascinating to hear about this study. Exciting. And we really look forward to hearing results down the line. Thank you for letting us have a word in as you think about the design of the next phase. And thank you for doing the work.

MS. MARTINEZ: Thank you.

CHAIRPERSON SCHWARZMAN: I'll move on now to

introduce Stephanie. So Stephanie Jarmul is Acting Chief of the Safer Alternatives Assessment and Biomonitoring Section in OEHHA. She'll provide a brief overview of the plan for SGP meetings in 2023. And then we'll have a little time for questions or discussion about that and then some open public comment period before we adjourn.

Thanks, Stephanie.

MS. JARMUL: Thanks, Meg.

And just two quick points before I get into the presentation. This presentation and discussion will likely be very brief, so we could always go back to the discussion on FRESSCA if there is some pressing questions you may have. And also today won't be the last opportunity for discussion, as you'll be hearing more from the Biomonitoring California team next year, after we've figured out some of the details that we've discussed today.

I'll go share my screen.

(Thereupon a slide presentation).

MS. JARMUL: Okay. Can you see my slides?

CHAIRPERSON SCHWARZMAN: Looks good.

MS. JARMUL: Okay. So I'm just going to briefly discuss our plans for next year's Scientific Guidance Panel meetings.

--o0o--

MS. JARMUL: You'll see that we've worked with the Panel to select the following dates and times. That will be Tuesday, March 7th, 10 a.m. to 1 p.m., so in the morning; Friday, August 21st, 1 p.m. to 4 p.m. in the afternoon; and then Monday, November 6, 1 p.m. to 4 p.m. And the Bagley-Keene exemption for having to meet in person has been extended until July of next year. So we will definitely hold the March meeting via Zoom webinar. And we'll make a decision on the meeting format for August and November after further internal discussions and factoring in any potential new language around Bagley-Keene that may be introduced before next July.

You'll also notice that we will be continuing with the half-day meeting format, as we discussed in November of last year, but we can always extend the meetings as needed.

--o0o--

MS. JARMUL: Similar to this year, our standing agenda will include a Program update, which will include an update on our community biomonitoring studies and an opportunity for discussion and input from the Panel and audience. There are other potential topics of interest that we have planned or could consider exploring. For the March meeting, we'll actually be hearing from Matt McLeod from the Stockton University in Sweden on his application

of -- oh, sorry, Stockholm. I think I said Stockton.

(Laughter).

MS. JARMUL: -- University in Sweden on his application of a population-based pharmacokinetic model to help interpret the PFAS data from CARE. That will be happening in March. The Program will also report back on our progress regarding the PFAS definition that we've discussed, I believe, at the July meeting -- or in March. And we'll be discussing that sometime later next year.

And we could also consider a discussion of the recently published National Academies of Science Guidance regarding the PFAS testing and clinical follow-up, and potential implications for State biomonitoring programs.

Other topics of interest that we could consider exploring include expanding the Program's capacity to biomonitor for pesticides, prioritization and development of laboratory methods, such as non-targeted screening, and how to better address climate change through the Program's activities.

And as always, we welcome any input from the Panel and audience on these items and additional topics we should consider. So I'll stop there and see if anybody has any questions or suggestions about this plan, either from the Panel or the audience or if that all sounds good.

PANEL MEMBER QUINTANA: This is --

CHAIRPERSON SCHWARZMAN: Jenny, yeah, go ahead Sorry.

PANEL MEMBER QUINTANA: Is this a good time to suggest additional topics?

MS. JARMUL: Sure.

PANEL MEMBER QUINTANA: Oh. I just remember -- and perhaps it's just me not following the literature, that we were very excited about measuring metabolites of 1-nitropyrene in urine as part of the various studies. And there was some debate at the time about differential levels in children versus adults and kind of best practices about -- around that issue, and how to interpret the levels.

And I just think it's so exciting if we could show the effects of the clean diesel programs by CARB and really show a public health benefit that I'd like -- I'd personally like to see more regarding this biomarker and the data collected and interpretations of it, as a suggestion.

MS. JARMUL: Thank you.

Any other suggestions or questions?

CHAIRPERSON SCHWARZMAN: José, that's fine, yeah.

PANEL MEMBER SUÁREZ: Yeah. Hi, Stephanie. So with regards to the biomonitoring for pesticides, are you -- is it what -- tell me a little bit more about your

interest in that regard. You want to know which ones to potentially be adding, what -- or what's the question, I suppose?

MS. JARMUL: That is part of it. And if the chemicals are currently on our designated list, the ones that are currently being used in California. We know that there is a lot of interest, especially through the AB 617 communities, that's a very common pollutant of concern for these communities. So it's certainly something we want to look into, whether we have the pesticides that they're using on our list, and if not, should we add them? And if we have them, do we have the methods to monitor for them?

PANEL MEMBER SUÁREZ: Got it. Okay. Yeah, I mean, making sure that I think the Program is monitoring, indeed, some of the most commonly used pesticides but across all the different kinds. I think for a lot of areas they're monitoring for insecticides. You know, the most -- some of the most commonly included, they're followed by herbicides, but not really much with fungicides. So it would be nice to kind of dissect a little bit the list that you have right now and seeing how much of each class really are being measured. And, of course, within each of one of those you have a lot of subclasses. And that's a whole topic. So I think like the discussion for biomonitoring of pesticides will

require a good amount of work.

MS. JARMUL: Definitely.

CHAIRPERSON SCHWARZMAN: Any other questions or comments for Stephanie and the Program, on priorities, and upcoming meetings, and things you'd like to hear more about?

PANEL MEMBER SUÁREZ: I have a question about -- so then the format is one of the things that you mentioned, whether to keep it -- so it sounds like for August, it would still be a virtual meeting and -- is that what I understood and then defining later on what the next -- how it should be in the future?

MS. JARMUL: Yeah, so -- and that's really because of the Bagley-Keene exemption, so -- of having to meet in person, so that is set to expire in July. So we need to have some more internal discussions within OEHHA to figure out what direction we're going to take, if and when that exemption does expire.

So that's why it's still TBD for August and November, if we might have a hybrid version like we did in July or some other policy.

PANEL MEMBER SUÁREZ: Okay. Thank you.

CHAIRPERSON SCHWARZMAN: Ulrike.

PANEL MEMBER LUDERER: Yes. You know, sort of related to your biomonitoring for pesticides, and I agree

that that -- that that is something that is -- it would definitely be worth pursuing and especially, you know, possibly pesticides that are not currently already being biomonitored under the Program. But related to that, the -- I'm thinking about maybe doing biomonitoring for pesticides in the context of occupation and doing some occupational study around that, because I think that's something that I know in the past the Program has done some occupational studies, but I think it would be useful to incorporate that into some of the future planning that we're -- you're going to be thinking about. And that might be one area in particular where it would be really interesting to do biomonitoring for pesticides.

MS. JARMUL: Thank you.

CHAIRPERSON SCHWARZMAN: Maybe I could just check and see about public -- or that -- sorry audience questions at this moment.

We'll go to the open public comment period in a minute, but if there's any email or webinar questions from attendees.

DR. HOLZMEYER: No new questions.

Thank you.

CHAIRPERSON SCHWARZMAN: Thanks, Cheryl.

Anything else from the Panel on what you'd like to see in the coming year? I know that the Program is

happy to take this kind of input at any point, but this is just sort of one focused moment where we have the opportunity.

In that case, maybe I will go back to the -- sorry, open the public comment period. We have 15 minutes allotted -- thank you so much Stephanie for the presentation.

We have 15 minutes allotted for the open public comment period. And this is really intended for any topic related to Biomonitoring California and webinar attendees can speak up by using the raise hand function or by submitting written comments via the Q&A function of Zoom or by email to biomonitoring@oehha.ca.gov and we'll read them out loud.

So I see we have a raised hand from Jianwen. Go ahead, please.

DR. SHE: Hi. This is Jianwen She. I'm one section. I'd like to follow up how Dr. Ulrike mentioned about monitoring an occupation exposed with pesticides. I do remember when the -- our laboratory start almost 12 years ago, the first project that we tried to do was monitor pesticide -- organophosphate pesticide exposure with the -- in the Tulare County.

And at that moment, we do not have full capability to monitor multiple biomarkers. I think today

the Program already developed the -- at least OP flame retardant -- OP pesticides multiple metabolites. Also monitor -- monitoring occupational exposure might be easy to explain, if any biological health effect exist. For general populations very hard to link that exposure levels, even we find it with specific person effect. So I really like that idea for the Program to consider in the future a round of study consider occupation exposure included in the pesticide proposal.

Thank you.

CHAIRPERSON SCHWARZMAN: Thank you.

Anyone else in attendance or is there anything on the email forum?

And Jianwen, are you raising your hand again or is the -- if so, you're welcome to unmute and speak.

Oh, you're still muted.

DR. SHE: Actually, I'm done now and tried to lower my hand. Sorry.

CHAIRPERSON SCHWARZMAN: No problem.

Stephanie, if there's --

MS. JARMUL: Actually --

CHAIRPERSON SCHWARZMAN: Oh, go ahead. Sorry.

MS. JARMUL: -- I do see a hand raised from Clay Larson. So, Clay, I'm going to give you permission to talk and you'll likely have to unmute yourself.

MR. LARSON: All right. Thanks. First, I'd like to note, I really enjoyed the presentation. We may be doing a presentation soon and I've talked to Stephanie several times. You guys set the bar a little -- pretty high for -- in terms of being able to duplicate the feeling of a real meeting. I'm impressed. We don't have Zoom, so we're a little disadvantaged.

I did have a question. And I checked a number of years ago, the -- there's an agricultural -- a couple agricultural chemicals that are designated zeranol and trenbolone. As of a couple years ago, there was no plans for monitoring those. I haven't checked since -- does -- as far as the Panel knows, there's still no plans for monitoring? And these are -- these are additives in -- used with beef cattle. Trenbolone is an -- is an androgen. It's legal in the United States. It's not illegal -- it's not legal in Europe and many other places in the world, but it's legal in this country. And so is there any -- does any of the Panel know of any plans to ever look at those chemicals?

MS. JARMUL: Sorry, Clay. Are you talking about biomonitor -- plans to biomonitor for them within our Program or external?

MR. LARSON: Yeah, I was -- I mean, they're designated chemicals in the Biomonitoring Program, but as

far as -- as again, when I checked a couple years ago, there was, I would say, no interest in, no plans for actually monitoring those chemicals, but I haven't checked for several years.

MS. JARMUL: Nerissa, did you want to say something?

DR. WU: Yeah. I guess I would just comment that there are many more chemicals on our designated and priority lists than we actually have laboratory capacity to measure. There, unfortunately, are many, many chemicals of interest that we recognize as being important to monitor, but our capacity is limited, and so it's a matter of trying to focus on what are the most -- the most pressing things or the priorities for our Program at the time within -- within that limit.

MR. LARSON: All right. Thanks.

CHAIRPERSON SCHWARZMAN: Thank you. And Stephanie or Cheryl, one last check, if there's anything -- anyone I'm missing on the webinar or anything on the OEHHA email that we should catch?

MS. JARMUL: (Shakes head).

CHAIRPERSON SCHWARZMAN: Okay. Hearing nothing. Thank you so much for that.

I -- Stephanie, do you want to give -- weigh in on the question of we have 10 minutes of people's time

that we could use. Should we adjourn now or did you want to return to the previous discussion? It seemed like that discussion had maybe wrapped up, but maybe I could ask the Panel if anyone has anything burning? It looks like Oliver has something he could say and then I guess I'll open it back up to the Panel for a moment and we have until 4 o'clock if anyone has anything that didn't get aired.

Oliver, go ahead.

PANEL MEMBER FIEHN: Yeah. I had wondered, there was something announced on the agenda of a declaration of emergency, Hunters Point Biomonitoring Foundation Corporation, what happened to that? Is that --

MR. JARMUL: That was a public comment that we had received via email and we have posted it to our website.

PANEL MEMBER FIEHN: Okay. So that's -- that's all that happens?

MS. JARMUL: Correct.

PANEL MEMBER FIEHN: Okay. I thought somebody wanted to say something. Okay.

CHAIRPERSON SCHWARZMAN: Any other questions or comments from the Panel members that we didn't get to?

In that case, I will make a couple of announcements that I need to make before we adjourn and we

can finish. The transcript of this meeting will be posted on the Biomonitoring California website when it's available. The next SGP meeting, as Stephanie mentioned, will be on March 7th 2023 and that's from 10 in the morning till 1 p.m. Attendees can join via Zoom webinar like this one.

And with that, I want to thank the Panel, a big thank you to the staff, and our guest speakers who made the meeting what it is today, and also to the audience who attended. And I'll adjourn the meeting.

Thank you very much.

(Thereupon the California Environmental Contaminant Biomonitoring Program, Scientific Guidance Panel meeting adjourned at 3:51 p.m.)

CERTIFICATE OF REPORTER

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing California Environmental Contaminant Biomonitoring Program Scientific Guidance Panel meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and thereafter transcribed under my direction, by computer-assisted transcription.

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 8th day of December, 2022.

JAMES F. PETERS, CSR
Certified Shorthand Reporter
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